JULY 4, 1936

Railway Age

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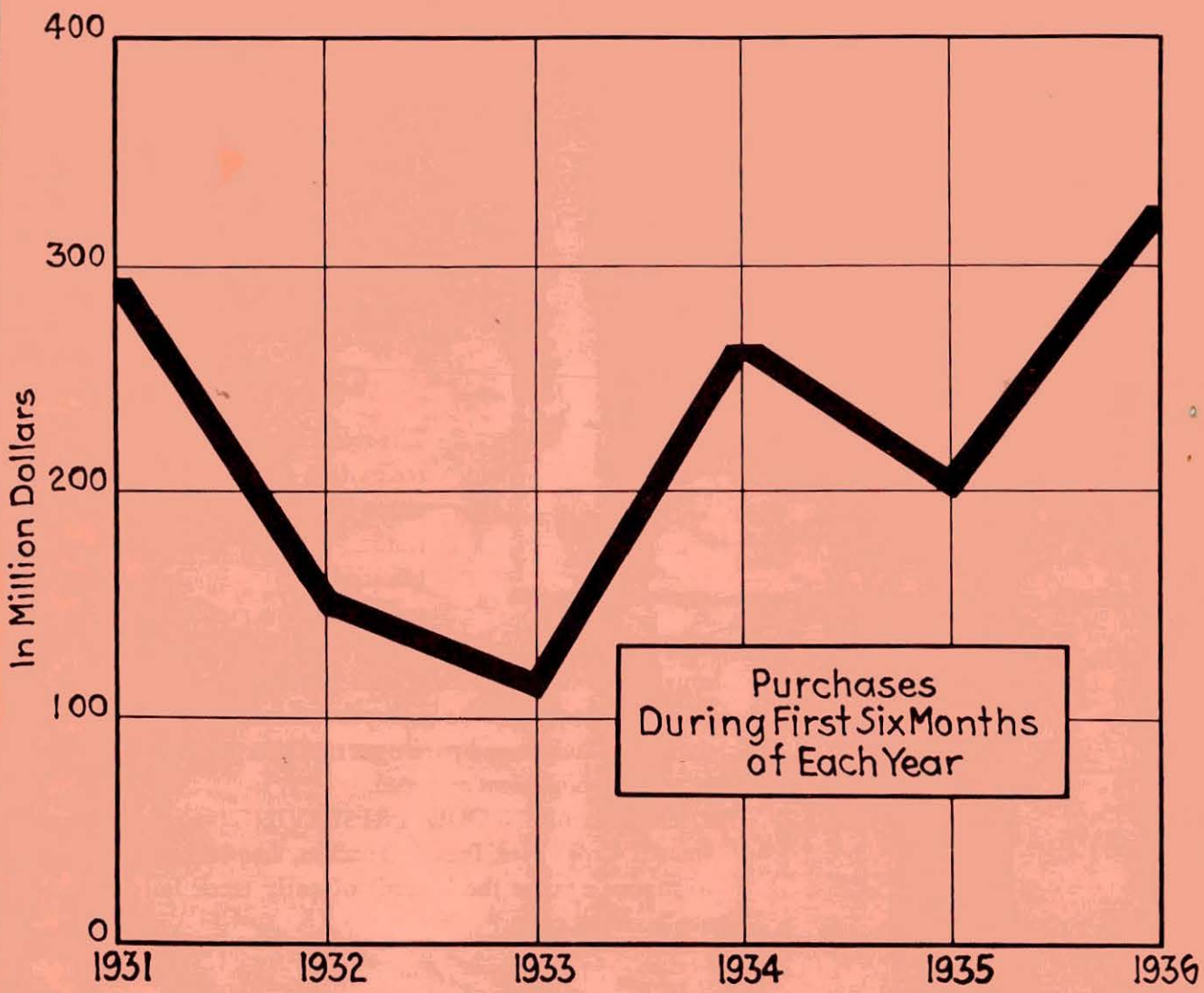
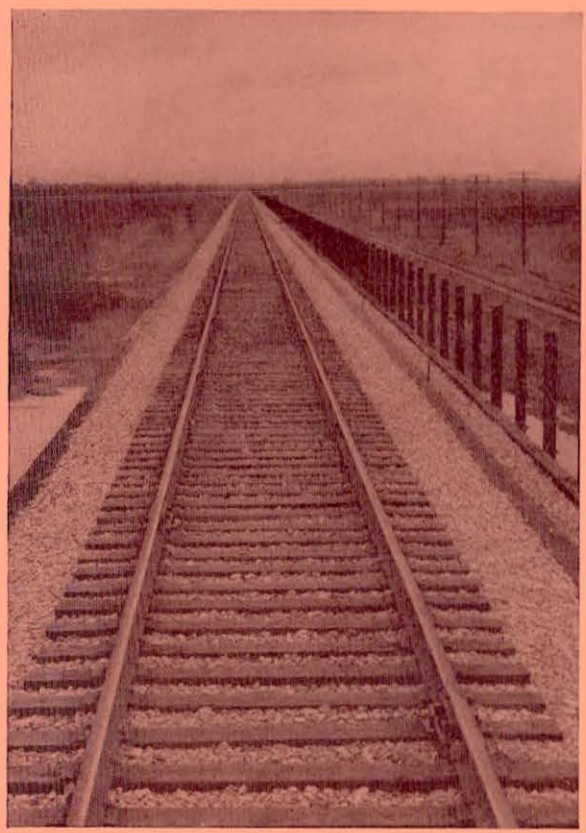
Railway Purchases from Manufacturers Highest in Six Years



The railroads of the United States are exerting a powerful force toward the restoration of employment by turning loose the largest flood of orders in six years. Those orders have been influenced largely by better business conditions, increasing traffic and better earnings, and all indications point to further increases. An article in this issue of the *Railway Age* makes a thorough analysis of purchases for the first six months of 1936.



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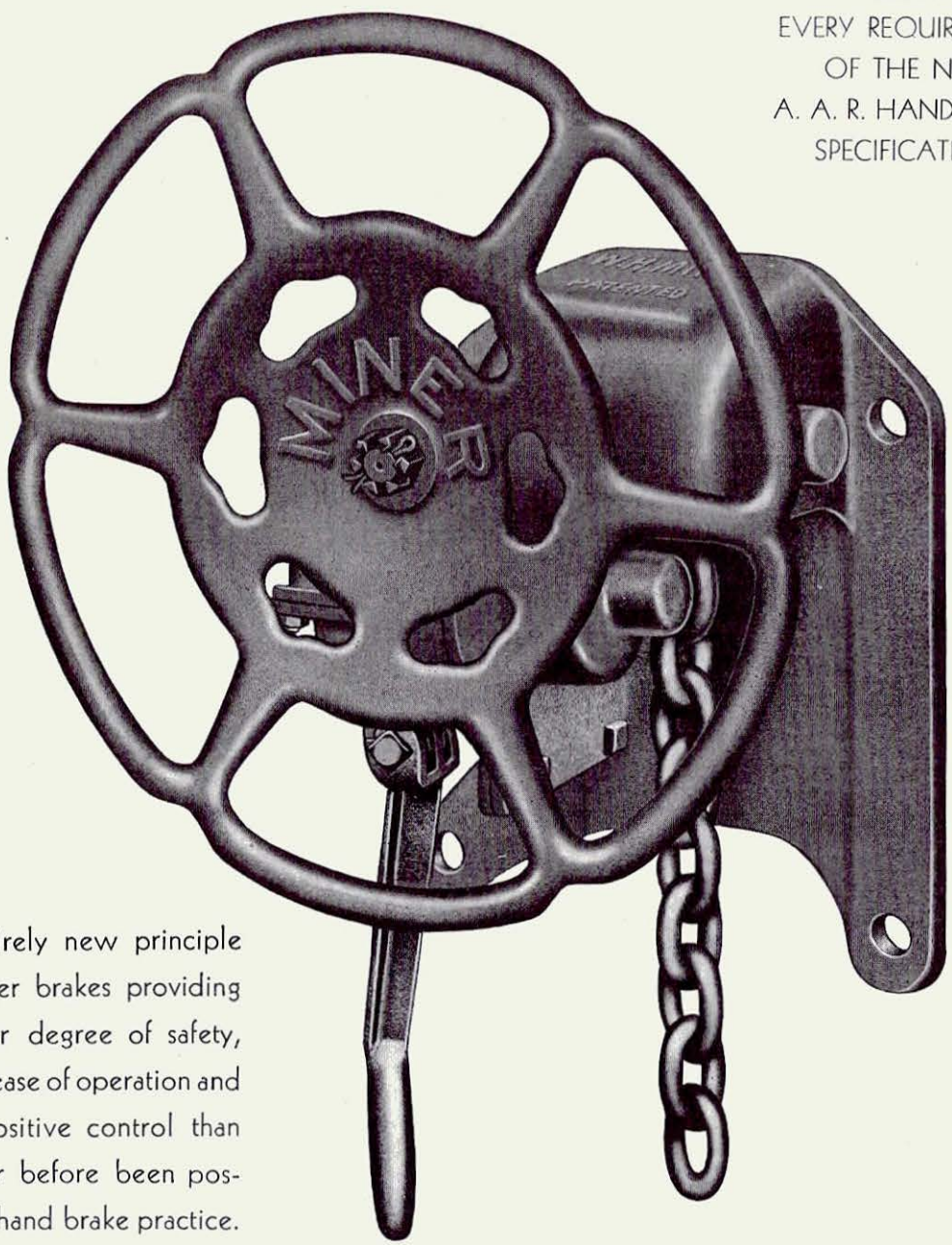

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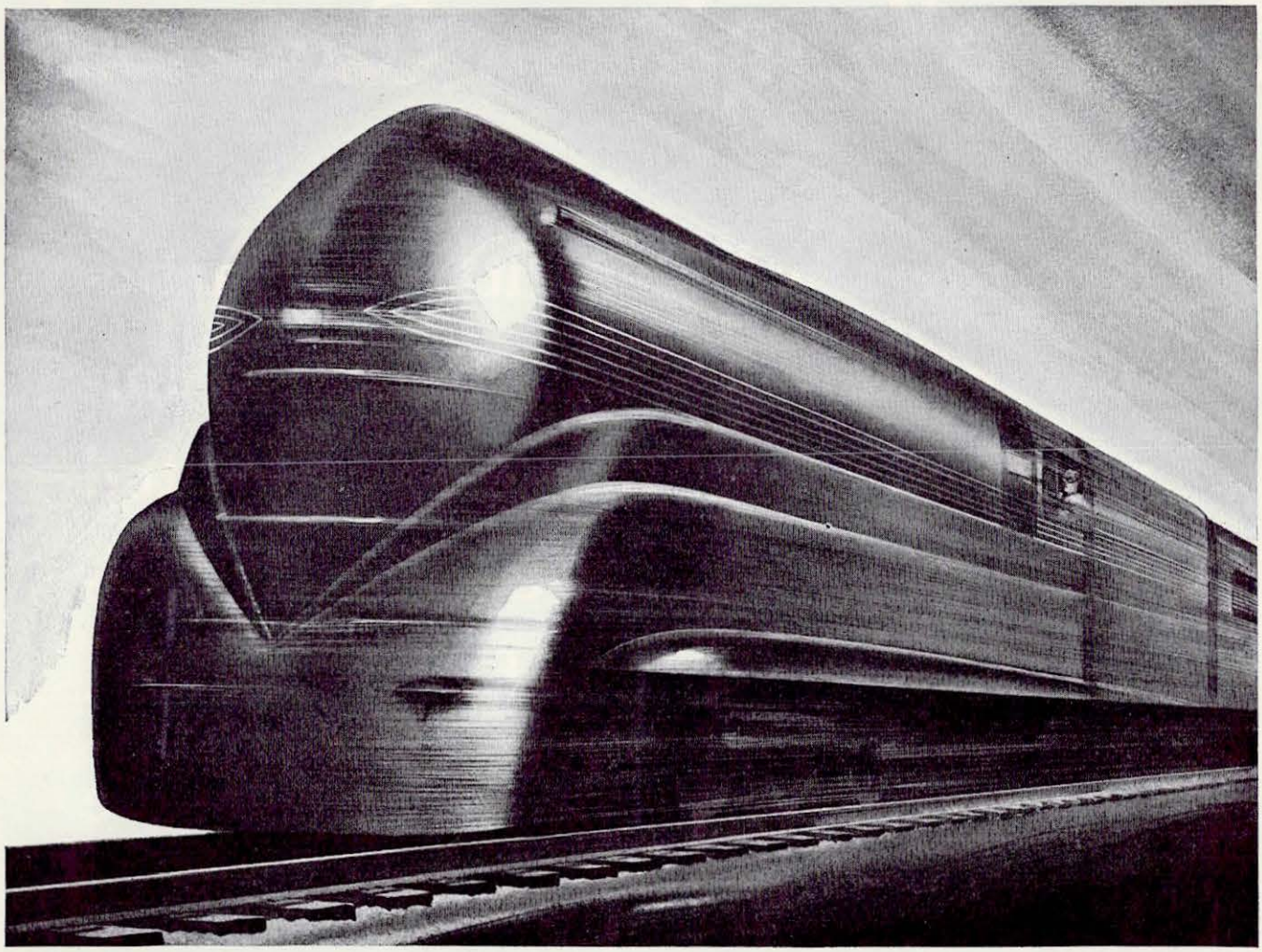

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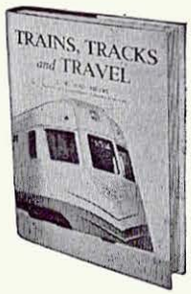

The new edition of this popular book on railroads describes latest practice. There is a complete new chapter on streamlined trains and additions to others covering the new developments in air brakes, air conditioning of passenger cars and in high-speed Diesel and electric locomotives. Among the numerous new illustrations are shown the new streamlined trains. This is an excellent book for a boy who wants to know more about railroads and for the average reader.

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Our Steam Railroads—The Railroad Track—The Steam Locomotive—Electric Locomotives; Gasoline and Oil Motors—Freight Cars—Passenger Train Cars—Tomorrow's Trains Become Today's—Passenger Stations and Terminals—The Operation of Trains.

1936. 4th. 312 pages, 276 illus., 7 x 9½ in., cloth, $3.00

Analysis of Railroad Operations

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Formerly Assistant Comptroller, United States Railroad Administration; Director, Section of Transportation Service—Federal Co-ordinator of Transportation

Without going into the details of accounting procedure, Mr. White clearly explains the accepted method of analyzing and interpreting railroad statistical data. He describes how the figures produced in accounting departments should be used in the study of railroad operating results; how these figures reflect the various activities of the railroad and its efficient or inefficient operation as a whole or in any of its departments.

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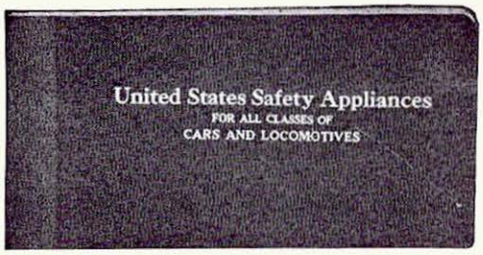

United States Safety Appliances

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The 14th edition of this book contains all the new laws, I. C. C. rulings and A. A. R. specifications since the last edition in 1928. More than 250,000 of these books have been sold.

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When Railroads Were New

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A fascinating human interest story of the early American and Canadian railroads and of the men who built and ran them. The author, an old railroad man, tells of the beginnings of the Erie, the Pennsylvania, the Baltimore and Ohio, the New York Central, the first Pacific railroad, the Santa Fe, the Rio Grande, the Canadian Pacific and other lines. It is illustrated with reproduction of wood cuts of early locomotives and railroad scenes.

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Who's Who in Railroading

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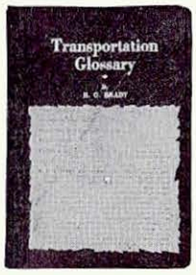
Transportation Glossary

By H. G. BRADY



Technical and semi-technical terms, phrases and expressions in more common use in railway, highway, air and marine transportation, and in port traffic are concisely defined in this handy reference book. Ordinary dictionaries, thesauri and law book sources furnish little information on transportation terms and this book fills a long felt need. It is printed in large clear type and cross references facilitate quick tracing of desired information.

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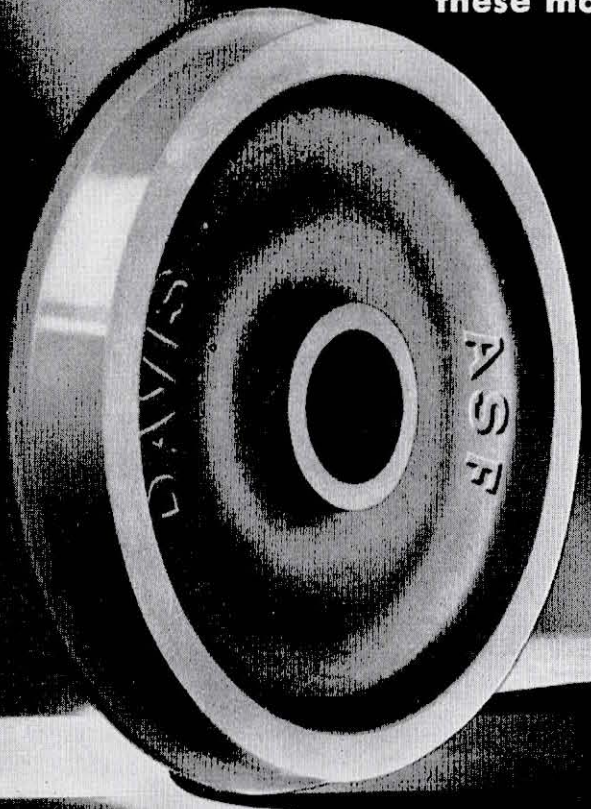

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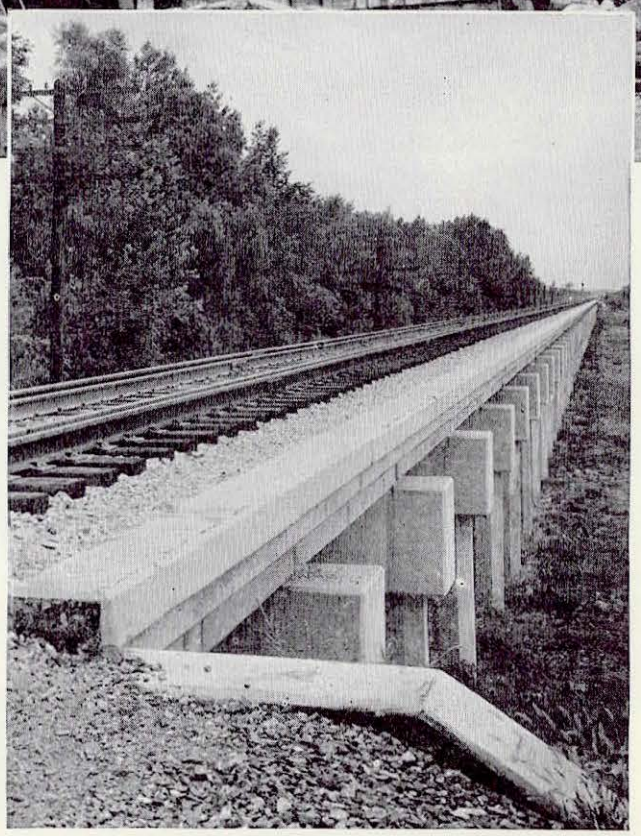

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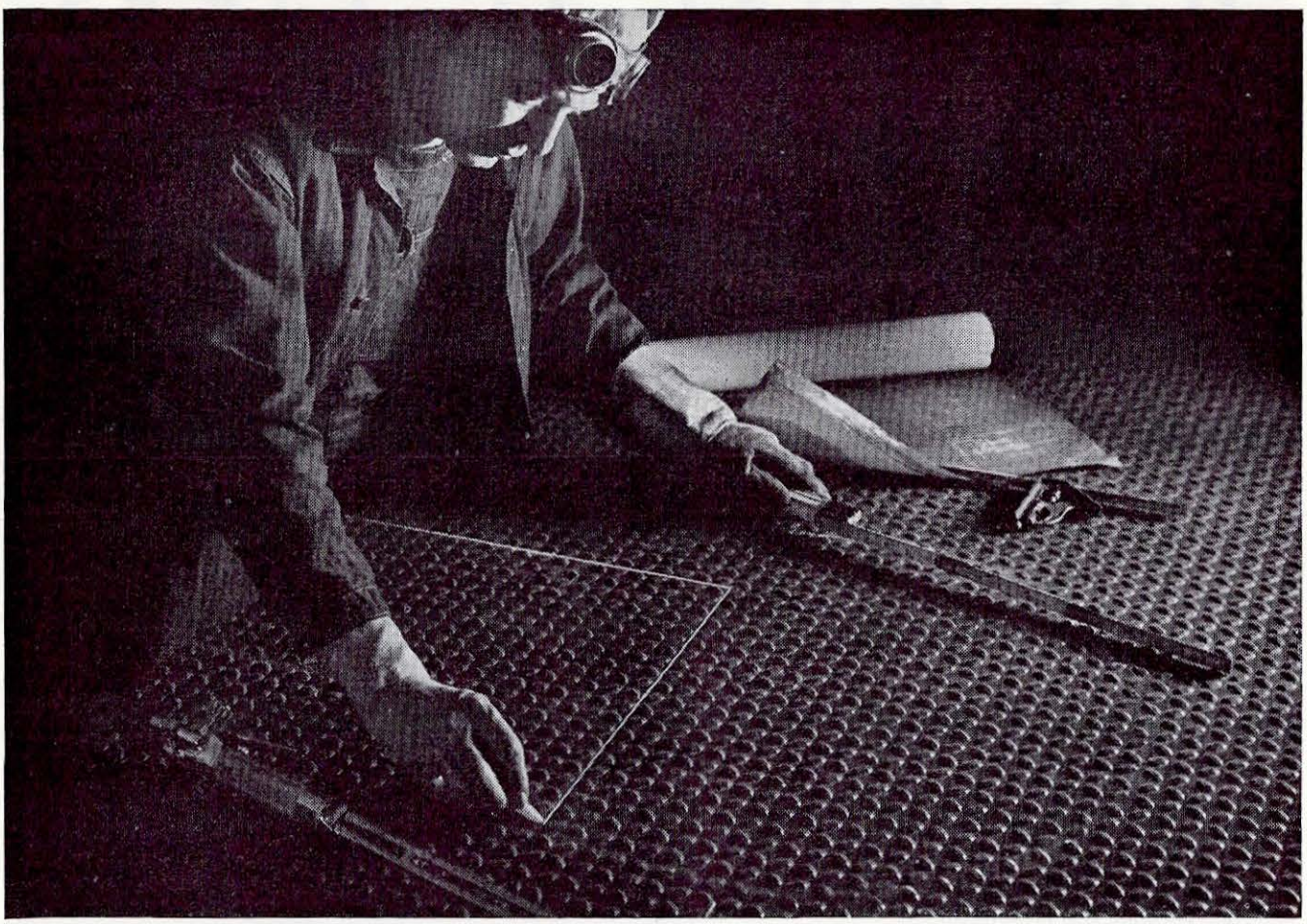

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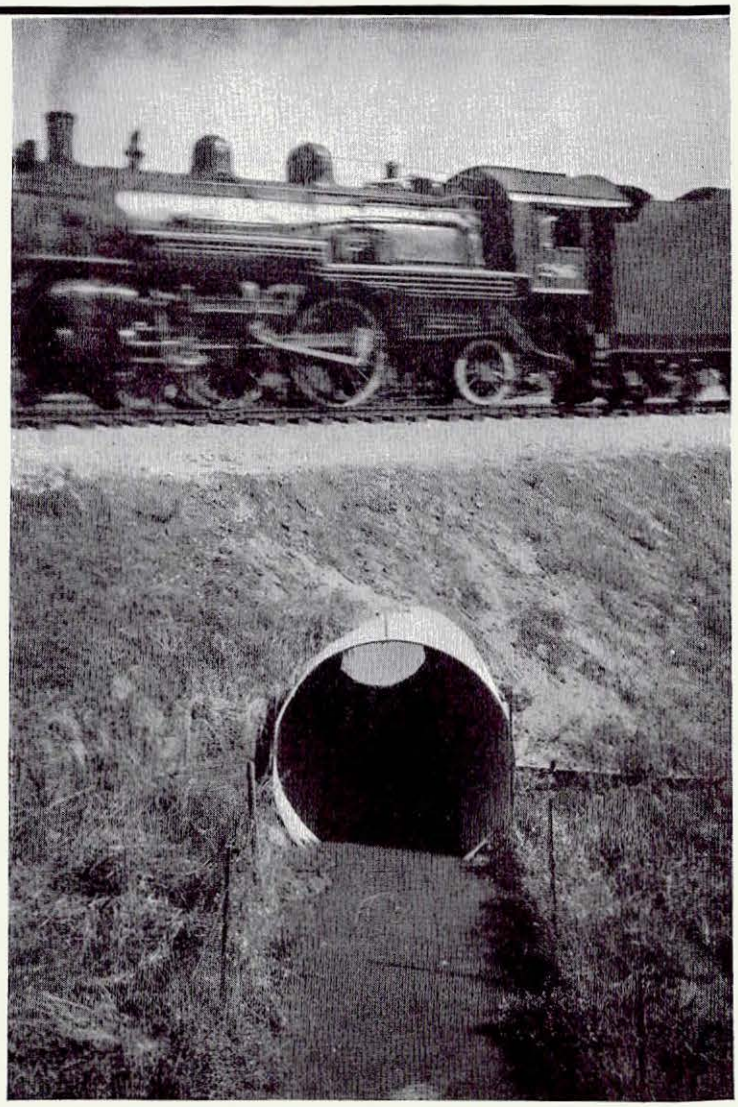

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Vol. 101 July 4, 1936 No. 1

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A comprehensive description of these twin trains, built by the Pullman-Standard Car Manufacturing Company and placed in service June 18 on the Union Pacific and the Chicago & North Western between Chicago and Denver, Colo.

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A presentation of summaries compiled by *Railway Age* which indicate that the carriers' 1936 purchases from the manufacturing industry have been 60 per cent in excess of the total for the first half of 1935.

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H. F. Moore, research professor of engineering materials, University of Illinois, tells how continued investigation, sponsored by railroads and manufacturers, has developed further data confirming conclusions reported a year ago.

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The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

EQUIPMENT BUYING IS REVIVING

During the first four months of 1936 the railroads of this country expended $230,000,000 for new equipment and materials other than fuel. » » » It is vitally important that these locomotives and cars, that are to run for years to come, should be given every opportunity to give maximum, economical service through use of modern materials, many of which have been developed while buying was inactive. » » » During this period Republic metallurgists have studied railroad equipment problems and have developed materials specifically designed to make locomotive and car service more effective and economical. » » » These men are at your service. Address Dept. RA. » » » » » » » »

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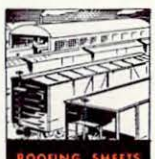

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RAILWAY AGE

An Attack upon the Middle Class

The national political struggle of this year will be a struggle between classes. Developments have made this inevitable. But it will not be between the "privileged few" and the "masses." Actually, it will be principally between all those who are self-reliant and competent and those who are not self-reliant and competent. It will be a test of the character and intelligence of the American people.

There are millions of self-reliant and competent persons in every rank of society in this country, whether the rank be measured by wealth, influence, social position or any other standard. Such persons may, and do, start life in the lower ranks, but, because of their self-reliance and competency, they always rise to higher ranks, and often to the highest. There are likewise millions of persons in every rank of society who lack self-reliance and competency. If they start in the higher ranks they descend to lower ones; if they start in the lower ranks they stay there. The self-reliant and competent can always be identified by their disposition to help themselves and, usually, others. Those lacking self-reliance and competency can always be identified by their disposition to want others to help them.

When any economic issue gets into politics the real question involved always is whether the power of government shall be used to hamper some for the benefit of others. There may be justification for a particular exercise of the power of government for this purpose. There was formerly, at least, justification for regulation to prevent railroads from unitedly charging shippers excessive rates. There is justification for enforcing anti-trust laws to prevent monopolies in naturally competitive industries from charging excessive prices. There can be no justification for a general government policy of hampering and burdening all those who are self-reliant and competent for the supposed benefit of all those who are not. Besides being unfair, any such general policy does not in the long run benefit anybody.

"Democracy of Opportunity"

As is always the case with political platforms, those issued by the two great parties this year obviously were both written principally to attract the maximum number of votes. But, in the main, they offer widely different kinds of bait. Nobody can read the Democratic platform carefully without realizing that there is implicit throughout it an invitation to all who doubt their own ability or willingness to make their way in life by their own efforts to rely upon a paternal government for assistance. This paternal government is to be the federal government, and it is to be permanently revolutionized in order to reduce or abolish the inequalities, trials and hardships of destiny. You are invited if you naturally have, or believe you have, less ability, thrift and foresight than your neighbors to look to the government for policies which will redress the balance in your favor and enable you to participate in the benefits of your neighbors' superior energy and thrift.

The Republican platform declares for "equality of opportunity." The Democratic platform declares for "establishment of a democracy of opportunity for all the people." The difference in phraseology is significant. "Equality of opportunity" means that government shall, as far as practicable, afford the same opportunities for all, and let each take advantage of them according to his ability and willingness to work. "Democracy" is a political word. The phrase "democracy of opportunity" was invented to be used for the first time in the platform adopted at Philadelphia, and what it was meant to imply is plainly indicated by the following quotations made at random from the platform:

"We are determined to erect a structure of economic security for all our people"—in other words, the government, not the people themselves, is to provide security. "We will continue to promote plans for rural electrification and for cheap power by means of the yardstick method"—i.e., the Tennessee Valley method of government ownership and subsidy in competition with private investment in power companies. "The government should steadily extend its housing program toward the goal of adequate housing for those forced through economic necessities to live in unhealthy and slum conditions"—meaning government subsidy at the expense of the taxpayers to help part of the people to pay their rent. "We recognize the gravity of the evils of farm tenancy." "We will continue to protect the worker and we will guard his rights." "We have undertaken to free (the American business man) from the ravages of cutthroat competition." "Where business fails to supply * * * employment we believe that work at prevailing wages should be provided" (by government). "We favor the production of all the market will absorb"—necessarily implying continuance of

government interference in agriculture and industry upon the assumption that such interference will be needed to prevent production from exceeding consumptive capacity.

Capital and Machinery in Production

There could be no more striking contrast than between the declarations from the Republican platform quoted in an editorial in the *Railway Age* of June 20 and those quoted above from the Democratic platform. Those quoted from the Democratic platform constitute a program for helping, from the cradle to the grave, each citizen with less than average ability, industry and thrift by imposing hampering governmental interference, competition and taxation upon each citizen of more than average ability, industry and thrift. The assumption, however, that those lacking these qualities should and will be benefited by having those possessing them constantly and increasingly interfered and competed with and taxed by government is not only contrary to the political and economic principles upon which the American system was founded, but also to all human experience.

The objective of all government and business policies should be the maximum practicable production of necessities, comforts and luxuries. To the attainment of this objective it is essential there shall be such a distribution of income and purchasing power among all classes as will create an effective demand and market for all that can be produced. But the production and distribution of commodities are not accomplished under our present economic system merely, or even mainly, by manual effort. They are accomplished by mental and manual effort using machinery.

All machinery is created by the investment of capital; and only by increase in the provision and use of the right kinds of machinery can there be caused increase in the production and distribution of commodities per worker and per inhabitant. For example, the increase in the investment in the railroad machine per employee was from less than $9,000 in 1913 to more than $15,000 in 1929, and it was this which made it possible for the railways largely to increase their output of transportation per employee in spite of a reduction in hours worked per employee.

Curtailing Capital—and Employment

The capital for creating and expanding the plant and machinery of production and distribution has been and must be provided by those, whether individuals or corporations, that save part of their income; and it is those who save small or large parts of their income that it is proposed government shall increasingly regulate, compete with and tax for the supposed benefit of those who it is assumed cannot make or accumulate enough to support themselves without government aid. But government could easily take enough from those who save to give to those who do not save to prevent the former from accumulating enough capital adequately to expand the productive and distributive facilities of the country. The consequent curtailment of expansion of these facilities would either make impossible the employment in private business and industry of all needing employment, or, if all were employed, make impossible a large and increasing production per worker.

It may be said government would provide employment for those not employed by private industry. But government policies that would curtail or prevent the accumulation and investment of private capital would destroy the source from which taxes must be derived for affording employment by government. In short, the policies implicitly or avowedly advocated throughout the Democratic platform are as skillfully adapted to preventing the accumulation and investment of the private capital essential to providing employment and incomes for those who do not themselves, by saving, contribute toward the accumulation of capital, as if they were expressly intended to accomplish that purpose. Their permanent adoption would do as much or more harm to those they are ostensibly intended to benefit as to those who are to be burdened by them.

The Common Denominator of New Deal Policies

The general policy advocated is that which has afforded the common denominator for some of the most important specific policies of the New Deal from its inception. The principal objective of such specific policies as those illustrated by NRA, the Guffey coal bill, the Social Security Act, the Railroad Pension Acts and the act taxing undistributed corporation earnings has been to curtail the incomes and tax the capital of the more provident class of the people for the purpose of increasing the incomes and security of the less provident class of the people. From whence has been derived the economic theories and principles upon which such policies are based? Plainly, from labor union leaders, socialists and persons consciously or unconsciously having socialistic tendencies. Almost everybody is more or less of a socialist regarding all incomes larger than his own. Probably most persons believe that the bulk of the national income goes to persons with large incomes and that any government policy which reduced these incomes would increase their own.

But what are the facts? What is a large income—$50,000 a year or more for a family? According to the estimate of the Brookings Institution the aggregate income of all families receiving $50,000 or more in 1929 was $11,405,000,000, or 15 per cent of the total national income. All families with incomes over $25,000 received 19 per cent of the national income. If all, and only, these are included in "the privileged few" that are being attacked in New Deal speeches it is plain that a very large part, or all, of their incomes would have to be transferred to those with smaller incomes if the incomes of the latter were, by any process of redistribution, to be substantially increased. Families with incomes of $2,000 to $25,000 received $44,000,000,000, or 57 per cent of the national income in

1929—three times as much in the aggregate as those with incomes of $25,000 or more, and almost four times as much as those with incomes of $50,000 or more.

An Attack Upon the Middle Class

All the arguments advanced for such policies and promises as constitute the essence of the Democratic platform are to the effect that their execution would benefit the poor at the expense of the rich. But it is easy with the foregoing figures to identify the class that would have to bear the great bulk of the burden of carrying out these policies and promises. It is the great middle class, which in 1929 had incomes of $2,000 to $25,000 a year per family, and in the aggregate received 57 per cent of the national income. The members of this class are not born in it. It is composed at any given time mainly of persons who have worked their way up from lower income classes, and many of whom are ambitious to rise into the higher income classes. Upon what principle of equity or economics can it rationally be contended that they should be handicapped and exploited by their government for the benefit of anybody? Even the assumption that the middle class could and would stand being thus handicapped and exploited, and that the poor would benefit as a result, is based upon no facts or experience. A protracted attempt to carry out government policies having these purposes would inevitably prevent the accumulation and investment of the amount of capital necessary to provide adequate income and employment for both the middle class and the poorer class.

The vitally important question with which we are confronted is what general policy of government will be most beneficial to all classes of the people. There is, of course, politics of the undesirable sort in the platforms of both parties. But it is inconceivable to us how any person of economic intelligence can carefully study both of them and arrive at any conclusion excepting one as to which party's success would be more likely to further the restoration of prosperity for all classes.

Six-Months Equipment Business Best Since 1930

More freight cars and more steam locomotives have been ordered for domestic service in the United States during the first six months of 1936 than were ordered during the entire 12 months of any year since 1930; and this year's orders for passenger-train cars are less impressive only when contrasted with the foregoing, since the half-year's total, already 70 per cent in excess of 1935's 12-month figure, is larger than the total for the 12-months of any of the five prior years except 1934. Also, 1936 rail orders, reflecting a similar upturn, already involve 94 per cent of the tonnage placed throughout 1935.

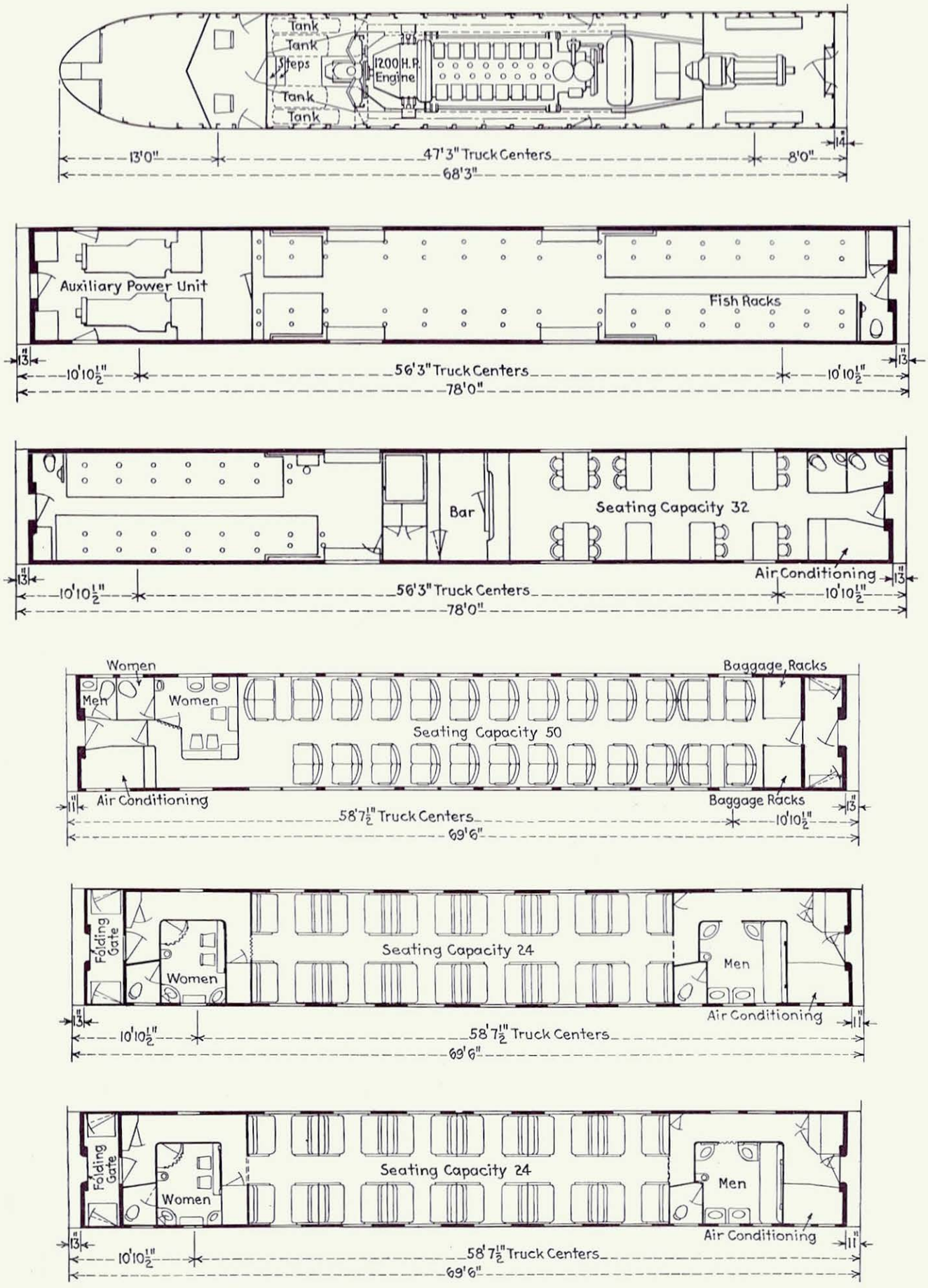
In June issues of *Railway Age* domestic orders for 4,320 freight cars were reported. These brought the total for the year to date to 26,560 cars as compared with 18,699 for 1935's 12 months; 24,611 for 1934; 1,685 for 1933; 1,968 for 1932; and 10,880 for 1931. In 1930 a total of 46,360 freight cars was ordered for domestic service. In addition there has been reported since the close of last month an order for 750 freight cars while on July 1 there were outstanding inquiries for 2,375 more, and plans had been announced for the acquisition of 1,000 others. Also, there is the 1936 export order for 400 box cars—the best export volume of any year since 1930, save 1934.

Thus far in 1936 a total of 122 locomotives, excluding power units for four streamlined trains, has been ordered. The June orders for 24, including 18 steam locomotives, brought to 104 the total of the latter type ordered during the first half of this year. This compares with 28 steam locomotives ordered throughout 1935; 72 in 1934; 17 in 1933; 5 in 1932; and 62 in 1931. There were, of course, additional orders for locomotives other than steam in these five prior years, the grand totals for 1934 and 1931—183 and 176 respectively—being above 1936's six-month figure of 122. Throughout 1935 a total of 83 locomotives of all types was ordered. On July 1 inquiries for 10 steam locomotives were outstanding.

During June, 20 passenger-train cars were ordered, making a total of 107 for the first six months of the year. As pointed out in the foregoing, this is 70 per cent in excess of the 63 passenger-train cars ordered during the entire 12 months of last year. Also, as pointed out in previous editorials, five streamlined trains have been ordered this year; and there were outstanding on July 1 inquiries for nine passenger-train cars.

Rail orders reported during June involved 10,000 tons, thus bringing the six-months total to 468,485 tons as compared with last year's 12-months total of 495,300 tons.

Furthermore, in addition to these markedly-favorable trends in markets for rolling stock and rail, the past six-months period has witnessed the most spectacular increase since the beginning of the depression in railway buying of materials and supplies of all kinds. As pointed out elsewhere in this issue, in an article presenting summaries of railway expenditures for the half-year, the 1936 purchases of materials, equipment and fuel have totaled approximately $451,650,000, including a dollar volume, exclusive of the fuel and equipment figures, which is 40 per cent in excess of that for the first six months of 1935, 120 per cent greater than 1933, and within 8 per cent of the comparable 1930 figure.



Floor Plan of the City of Denver, Including the

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The New Streamliner

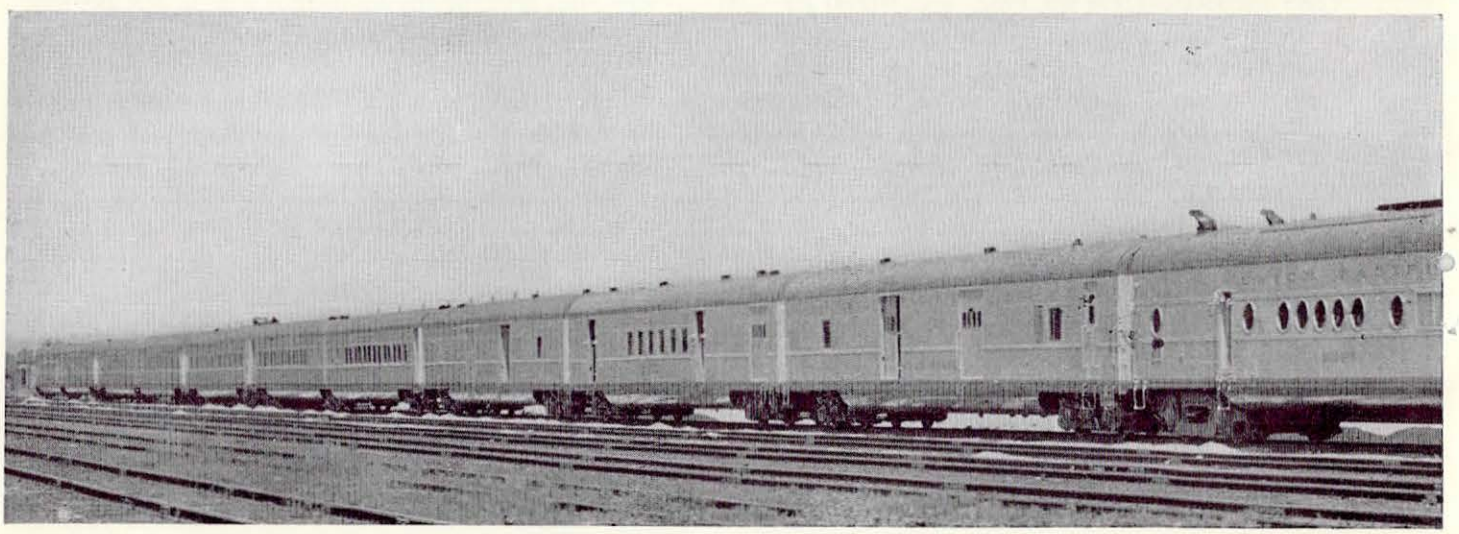
CITY OF DENVER

THE "City of Denver" twin trains built by the Pullman-Standard Car Manufacturing Company and placed in service on the lines of the Union Pacific and the Chicago & North Western between Chicago and Denver, Colo., on June 18, is an unusual train in several important respects. Consisting of a two-unit articulated locomotive and ten partially articulated, trailing revenue units, each of the two trains has a total overall length of 864 ft., and a capacity including one person per berth, of 182, thus being the longest and having the largest passenger-carrying capacity of any of the light-weight, high-speed trains yet placed in service.

These trains also operate on the fastest long-distance schedule in regular service in this country, making the 1,048 miles between Chicago and Denver, Colo., in a total elapsed time of 16 hours, including eight station stops, or at an average speed of 65.5 m.p.h. An examination of the time cards shows that eastbound from Denver to Omaha, Neb., the train makes 559 miles in a total time of 8 hr. 15 min., or at an average speed of 67.8 m.p.h.; and during this run the distance of 218 miles from Julesburg, Colo., to Grand Island, Neb., is negotiated at an average speed of 74.8 m.p.h. The maximum schedule speed attained is 102 m.p.h. for a short distance of 5.1 miles just east of North Platte, Neb. Westbound the run is designated as No. 111 and eastbound as No. 112.

A High Expression of Modern Car Builders' Art

From the point of view of external appearance, luxurious interior furnishings, tasteful decorative treatment and the provision of facilities for passenger comfort, convenience and ease of riding, the City of Denver is a high expression of the modern car builders' art. In addition to three Pullman sleeper units, a Pullman bedroom-observation unit and a diner, notable for attractive appointments, this train also carries two coaches, hardly less beautiful in interior decorative treatment, which are made available for the use of passengers without extra fare. Complete air-cooling and conditioning equipment is installed to furnish an adequate supply of clean, tempered air in all passenger compartments. The train is provided throughout with special lighting fixtures which produce



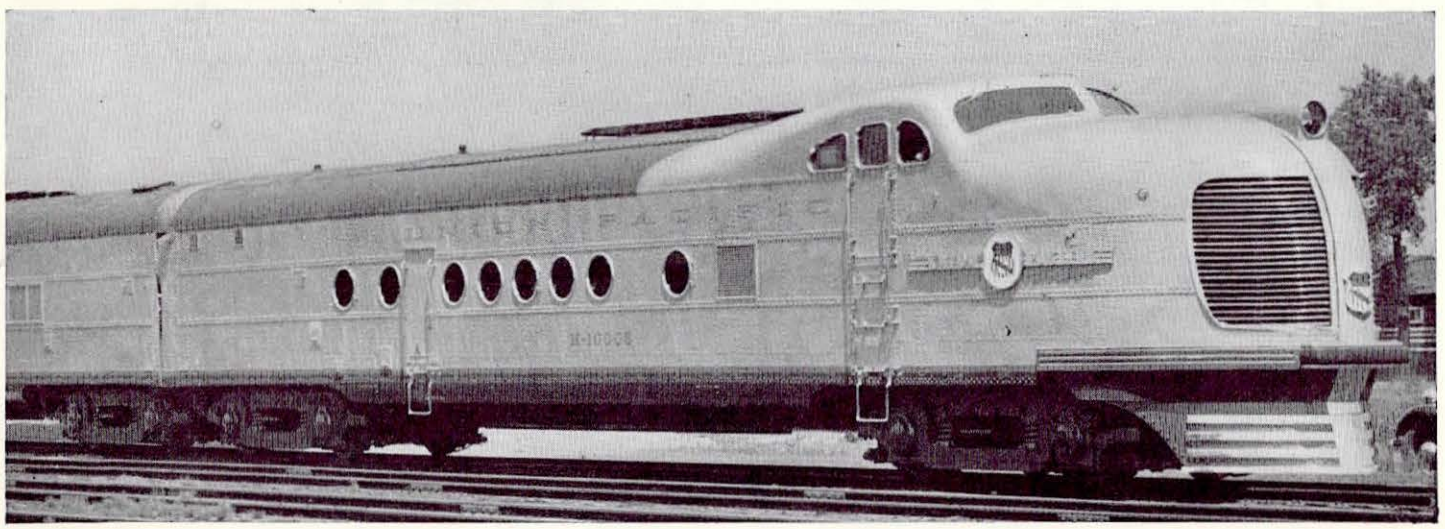
pleasing effects and furnish adequate light for general illumination, reading, night lights, etc., dependent upon the requirements.

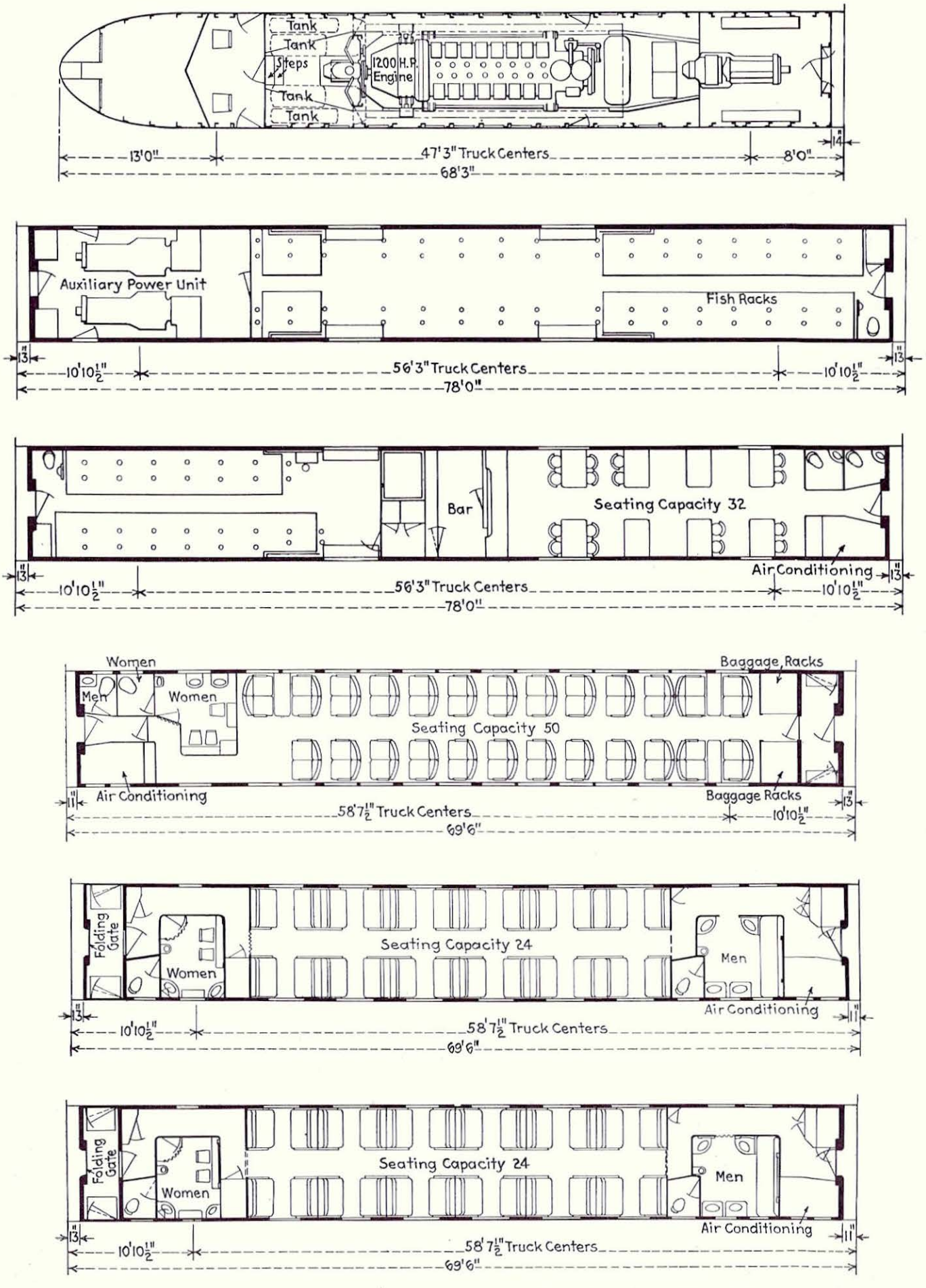
Still another unique feature is the equipment of one of the baggage cars just ahead of the coaches with a replica of a frontier tavern, called the "Frontier Shack," which is authentic in every detail, including square-nailed sheathing on the walls, hinged side tables, suspended lamps, old mahogany bar, mounted animal heads, rifle, horns, old posters, etc., and hence interesting from an historical standpoint as well as for its facilities to serve passengers. The frontier shack was built into the train as an added feature for the pleasure of coach as well as Pullman travelers on the City of Denver. In it is installed a radio. A second radio has a loud speaker in each coach and there is a third radio in the observation room. Radio reception is also available in the dining car. The intercommunicating train telephone system is the same as that installed in the "City of San Francisco."

General Description of the Equipment

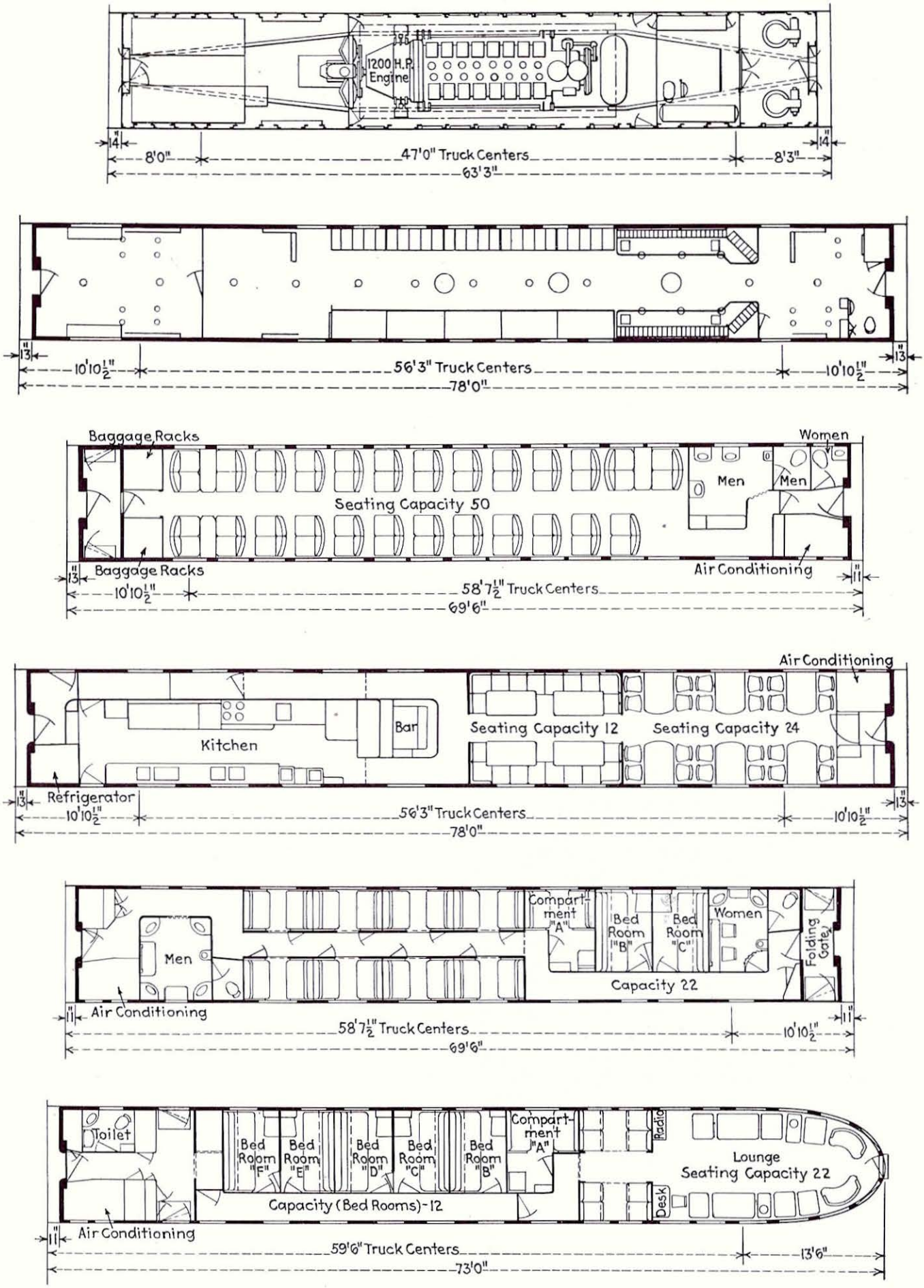
Each train weighs 1,268,450 lb., light, and 1,333,900 lb., ready to run. Both train units are practically identical in general construction and interior equipment and, moreover, greatly similar to the Union Pacific nine-unit articulated streamliner City of San Franciso, described in detail in the *Railway Age* issue of May 30, 1936. Like this train, the City of Denver is driven by a two-unit locomotive, equipped with dual 1,200-hp. Electro-Motive Diesel-electric power plants, the chassis and bodies of which are built of Cor-Ten steel. The cars in the train, constructed primarily of aluminum alloys, include an auxiliary-engine-baggage car, a baggage-mail car, a baggage-tavern-room car, a two-unit articulated coach, a diner, a two-unit articulated Pullman sleeping car and a two-unit Pullman car made up of a sleeper unit and a Pullman bedroom-observation unit. The seating capacity of these cars is as follows: Tavern room 32; forward coach 50; rear coach, 50; dining section, 24; cocktail section in the diner, 12; first sleeper, 24; second sleeper, 22; third sleeper, 24; bedroom-observation unit, 34; total 272.

The locomotives and the trucks of the City of Denver are essentially the same as those used on the City of San Francisco. The principal differences in construction of the cars are the provision of a somewhat larger cross-section with straight, instead of taper, car sides and a glass-enclosed observation end, instead of a more radically streamlined end, housing a pantry. The cross-section dimensions have been increased as follows: Roof height above rail, 11 ft. 4½ in. to 12 ft. 8 in.; outside width over sheathing 9 ft. 7⅜ in., to 10 ft. 5/16 in.; inside clear height, 7 ft. to 8 ft. 1 in.; inside width, 8 ft. 11⅞ in., to 9 ft. 5½ in. These increased dimensions make possible the provision of wider seats and aisles

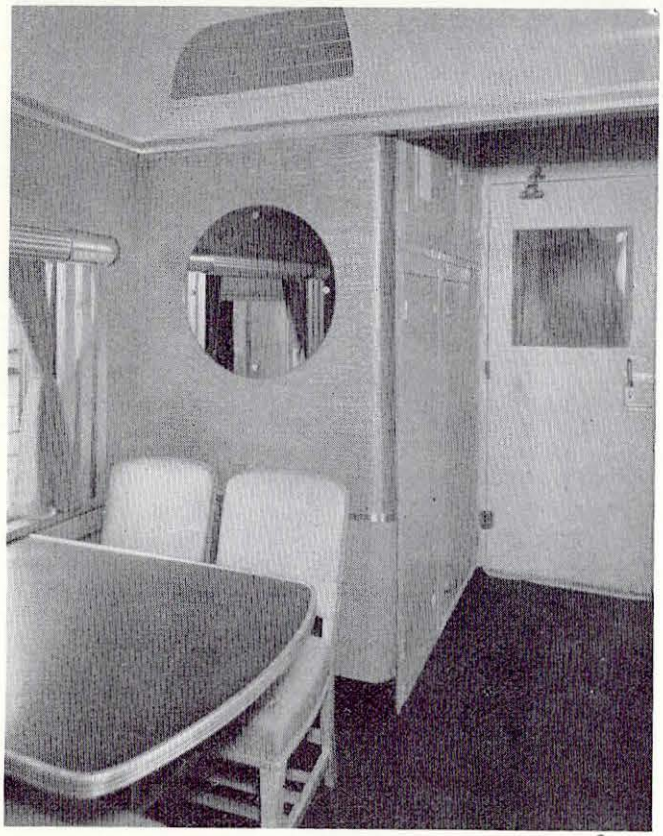




Floor Plan of the City of Denver, Including the

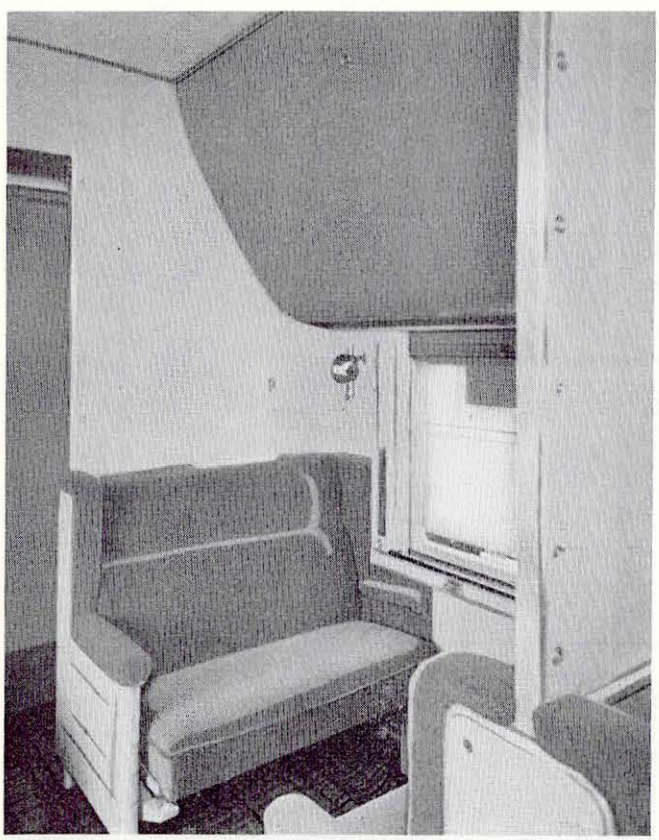


Locomotive—Locations of the Trucks Are Shown



Flexwood Finish and Tinted Plate Glass Mirrors Provide an Attractive Dining-Car Interior

finished in three shades of tan, with tan twist-weave carpet, sea green mohair seat covering and ecru window shades with a tan horizontal stripe design. The general color scheme in the washrooms is three shades of blue. The base coloring is of a dark shade; the wall coloring is of a softer shade of gray-blue, and the ceiling is of light ivory with a faint bluish cast. The window-shade material is of the rose color used in the main room.



Pullman Sleeping Section Equipped with Adjustable Lower-Berth Reading Light

The bedrooms and compartments in the rear unit have the same color schemes as given above; i.e., two bedrooms ensuite in blue; two bedrooms ensuite in tan; a compartment in blue; and a single bedroom in blue. The passageway is done in three shades of tan. Window shades are of ecru color with tan horizontal lines. Curtains are of rose color and the carpet is a tan twist-weave.

The observation room is finished in two shades of tan with an ivory ceiling. The same twist-weave carpet and ecru window shades are used as has previously been described. The card section seats in the forward part of this room are upholstered in chamoir-colored mohair with a small check design. Four chairs are bleached walnut, upholstered in a red twist-weave mohair; three chairs are bleached walnut, upholstered in a check pattern of sea green. The four settees are bleached walnut, upholstered in a brown Moquette with a diagonal plaid pattern in gold. Magazine tables are bleached walnut as are also the writing desk and the radio cabinet.

Figured Tamo veneer is used on the side walls and the bulkhead of the observation room from the window capping to the curtain rail, and these panels are framed with alumilited moldings. The air duct soffit is trimmed with alumilited moldings. Two round mirrors, on the forward bulkhead, are made of peach-colored glass. Rubber tiling in the toilet, passageway and vestibule is of brown and tan mottled design, with 4-in. squares.

Novel Lighting Fixtures

The lighting fixtures, throughout the train provide artistic lighting effects. General illumination is given by both direct and indirect light. A distributed light intensity of 10 foot-candles is available, without glare, at the reading plane. Subdued blue light is provided for night use.

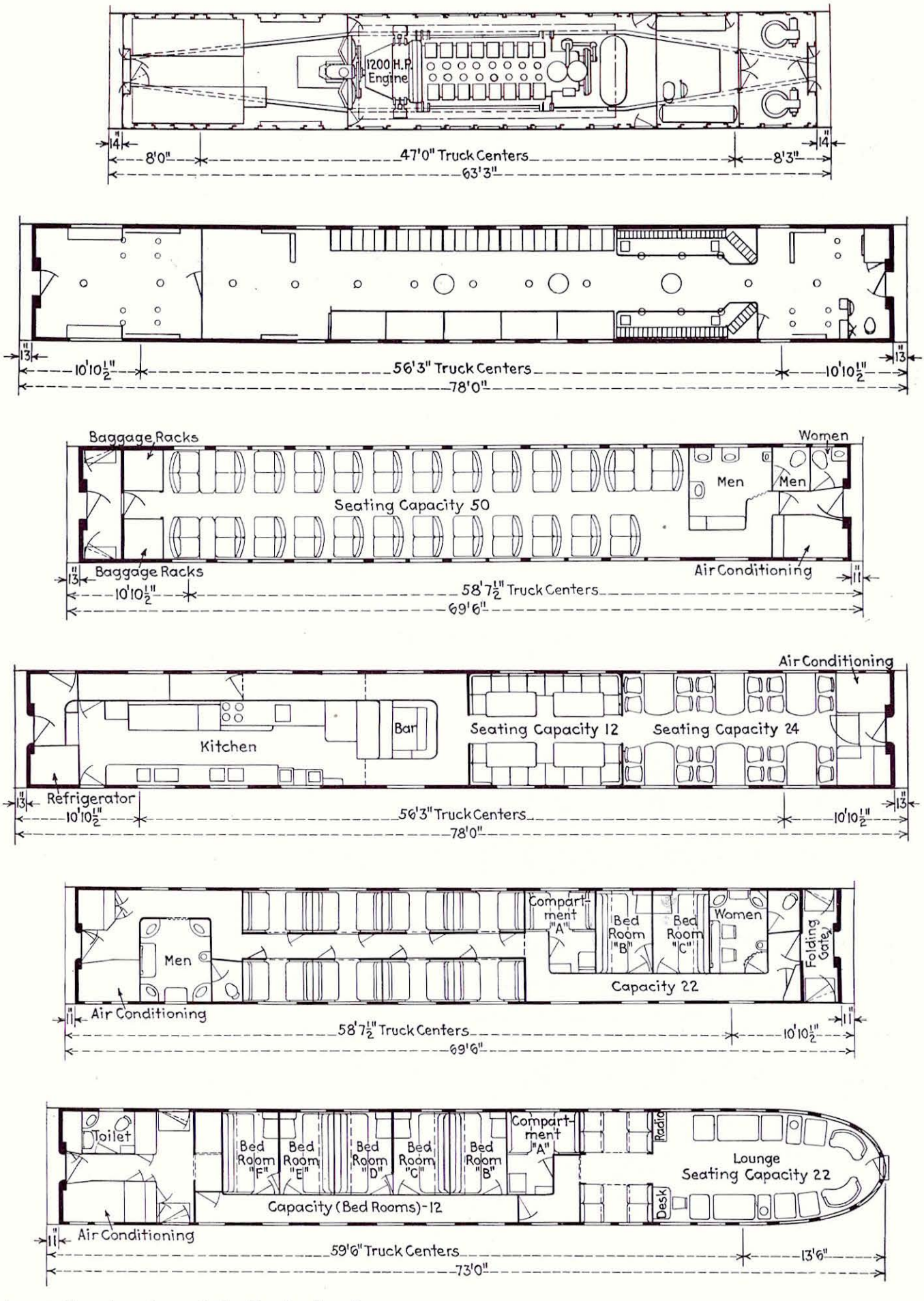
In the Pullman units, an adjustable lower-berth reading light is used for the first time, which permits the occupant to direct the light where it is most needed to meet the requirements of his particular position. A blue night light, within the fixture, is controlled by a double-throw toggle switch with a luminous tip. On the ceiling, a continuous combination direct-lighting fixture and air-conditioning distribution duct is used, running from one end of the car to the other. This also has blue night lights within it which are controlled by separate switches.

In the Pullman bedroom-observation unit, a semi-indirect louvered trough light is used, which is applied above the windows and continues completely around the interior. It is constructed so that 70 per cent of the illumination is thrown onto the reading plane, 20 per cent is reflected to the ceiling, and, for decoration, 10 per cent is directed through a blue-colored screen and reflected onto the face of the trough. It is interesting to note that this extruded aluminum trough is curved around the end of the car, which presented an unusual problem in manufacturing.

In the dressing rooms throughout the train, a new type of tubular fixture is used which provides effective lighting at the mirrors. These lighting fixtures are of Pullman Company design.

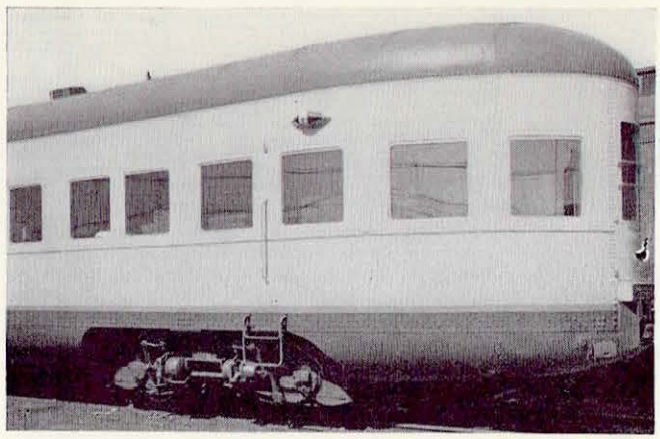
Train Control and Cab Signals

The locomotives of the "City of Denver" streamliners are equipped with a composite cab-signal and speed-



Locomotive—Locations of the Trucks Are Shown

Non-Articulated Connection between Two of the Passenger Cars



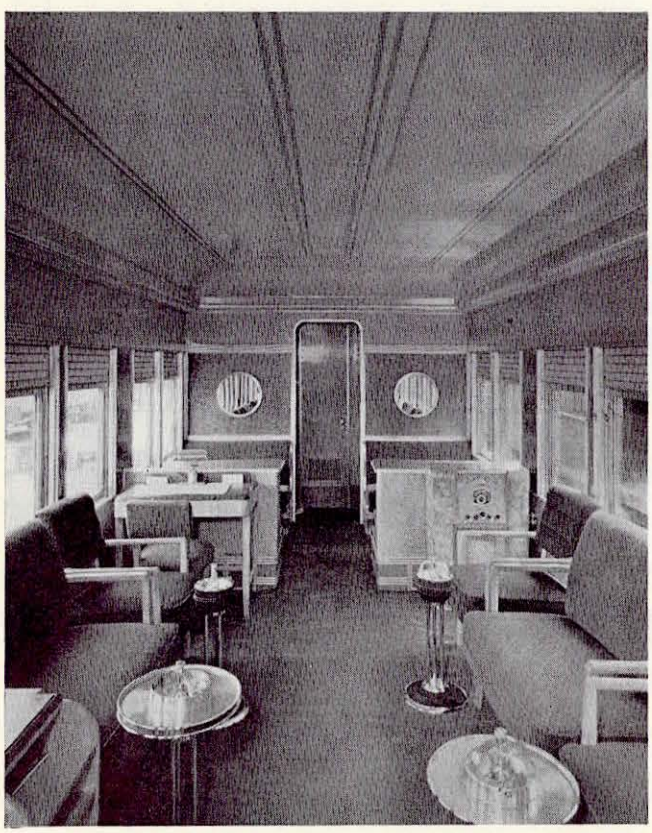
Rear-End Construction of the City of Denver

and give a general impression of roominess which is appreciated by passengers on long trips.

The only differences in the two City of Denver train units are in certain of the specialties. The trucks of the M-10005, for example, are equipped with SKF roller bearings and the train brake equipment was furnished by the New York Air Brake Company. On the M-10006, Timken roller bearings are applied to all truck journals and the train brake was furnished by the Westinghouse Air Brake Company.

The Dining Car

Particular interest centers about the dining car of the City of Denver which is not only fully equipped with a modern kitchen, dining section and cocktail room, but, like other passenger cars in the train, employs a generous use of Flexwood natural wood veneer and treated aluminum trim to secure beautiful and artistic interior effects.



Forward End of the Lounge at the Rear End of the Train

The walls in the cocktail section and throughout the hallways are covered with Avodire veneer, with the grain running horizontally, matched over the windows and slip matched where the pier panels meet horizontal grain above the windows.

The window trim, curtain boxes, frieze mouldings, ceiling moldings, side of upper duct and bulkhead moldings are finished in Alumilited aluminum. Window cappings are of bleeched walnut. Rubbed enamel finish is used on the headlinings in the hallway, lobby, bar passageway, air-duct soffit and on the ceiling panels, the color being the same as in the coaches.

The wainscoting and the low partitions are covered with imitation pigskin leather. The floor covering throughout the dining room and hallway is of seamless broadloom carpet, Balsam green in color, applied over ⅜-in. sponge rubber padding. The bar-room floor is of designed Pyroflash tiles.

The Cocktail Lounge Section

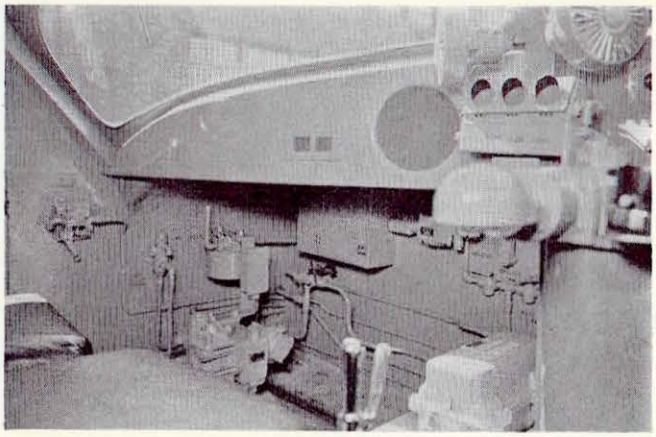
Off the cocktail lounge section, in the lobby, is an open serving bar. The front and sides are covered in redwood burl veneer with vertical grain; the bar top is of black gloss-finish Formica, having inlaid aluminum lines at the edges. The window shades throughout the main room and the hallway are of beige-colored silk-faced fabric. The window drapes are light green in color, lined with ivory-colored sateen, tied back with 2½-in. soft cuffs of the same material.

The 24 dining chairs are of bleached Walnut, with Dunlopillo rubber seat cushions covered with genuine pigskin. The cocktail-section lounge seats are of bench-type construction, built up in pairs and seating twelve. The exposed woodwork is of bleached walnut. The rubber cushion covering is of full-top-grain, saddle-finish red leather.

The dining room tables have Formica tops of dull-finish bottle green, and beaded edge. The portable cocktail-lounge tables have dull-finish black tops, made of the same material, with beaded edge and center pedestals.

The cocktail-lounge section is separated from the dining room by a low partition, topped with an etched edge-lighted thick plate glass. The partitions between the cocktail-lounge section and the lobby have ornamental welded design aluminum grilles. On the bulkheads opposite the bar are placed 24-in. round mirrors of green tinted glass.

The display part of the cocktail-lounge bar has a triple mirror, the center one being of light acid-etched texture with plain silver line decorations. The two side mirrors are of green tinted glass. Illumination of glow-



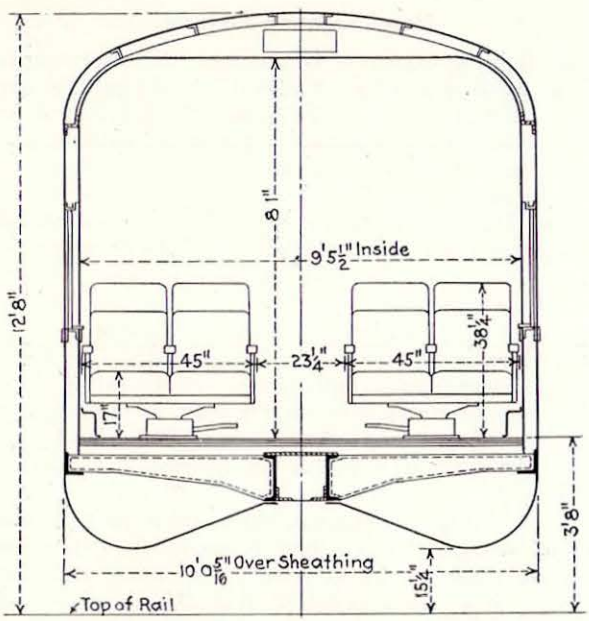
A.T.C. Cab Indicator and Air Brake Equipment, Including the Decelerometer, in the Cab

light effect is furnished through 1½-in. crystal glass columns.

A 15-tube RCA radio receiving set, with control, is in the pantry connected to a loud speaker in the bulkhead over the bar.

Special Features of the Pullman Cars

The two bedrooms in the second sleeper unit and four of the five bedrooms in the rear body unit are built ensuite; that is, arranged with sliding partitions between each pair of rooms which can be thrown back to form a large room. Each bedroom has a sofa with folding armrest, the sofa back being specially designed so that, when

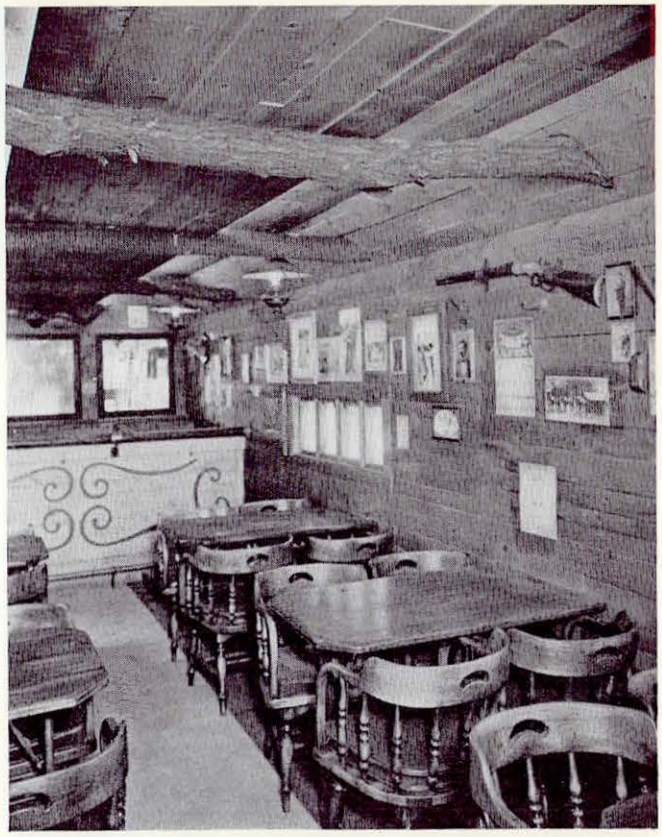


Cross-Section of the City of Denver Coach

raised, it serves as an upper berth. All cushions and mattresses are of rubber construction.

The first and third sleeper units have open sections and the second has sections enclosed with louvered panels. Both open and enclosed-section units are decorated in three shades of tan enamel. A dark tan shade is used at the base, the side walls are a lighter shade of the same color, and the ceilings are done in a light ivory tan. The floor covering in these sleepers is of plaid carpet with a green base and colorings in rose and black forming the design.

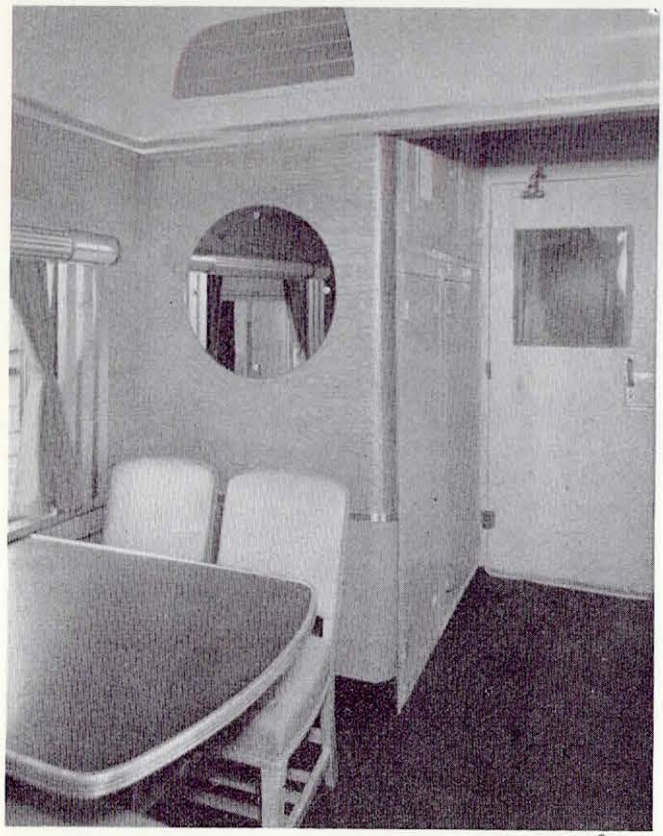
The compartment walls in the enclosed-section sleeper



The Frontier Tavern Room in One End of the Baggage Car Just Ahead of the Forward Coach

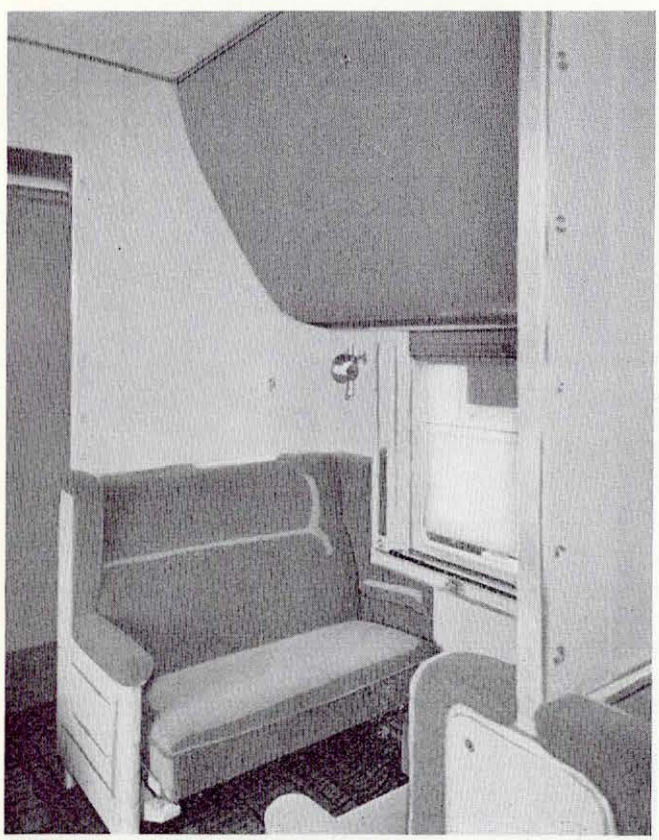
unit are decorated in three shades of blue, with a tan twist-weave carpet. The seat covering is in henna and the window shades are of rose color. The bedrooms are

Cocktail Lounge Section in the Dining Car



Flexwood Finish and Tinted Plate Glass Mirrors Provide an Attractive Dining-Car Interior

finished in three shades of tan, with tan twist-weave carpet, sea green mohair seat covering and ecru window shades with a tan horizontal stripe design. The general color scheme in the washrooms is three shades of blue. The base coloring is of a dark shade; the wall coloring is of a softer shade of gray-blue, and the ceiling is of light ivory with a faint bluish cast. The window-shade material is of the rose color used in the main room.



Pullman Sleeping Section Equipped with Adjustable Lower-Berth Reading Light

The bedrooms and compartments in the rear unit have the same color schemes as given above; i.e., two bedrooms ensuite in blue; two bedrooms ensuite in tan; a compartment in blue; and a single bedroom in blue. The passageway is done in three shades of tan. Window shades are of ecru color with tan horizontal lines. Curtains are of rose color and the carpet is a tan twist-weave.

The observation room is finished in two shades of tan with an ivory ceiling. The same twist-weave carpet and ecru window shades are used as has previously been described. The card section seats in the forward part of this room are upholstered in chamoir-colored mohair with a small check design. Four chairs are bleached walnut, upholstered in a red twist-weave mohair; three chairs are bleached walnut, upholstered in a check pattern of sea green. The four settees are bleached walnut, upholstered in a brown Moquette with a diagonal plaid pattern in gold. Magazine tables are bleached walnut as are also the writing desk and the radio cabinet.

Figured Tamo veneer is used on the side walls and the bulkhead of the observation room from the window capping to the curtain rail, and these panels are framed with alumilited moldings. The air duct soffit is trimmed with alumilited moldings. Two round mirrors, on the forward bulkhead, are made of peach-colored glass. Rubber tiling in the toilet, passageway and vestibule is of brown and tan mottled design, with 4-in. squares.

Novel Lighting Fixtures

The lighting fixtures, throughout the train provide artistic lighting effects. General illumination is given by both direct and indirect light. A distributed light intensity of 10 foot-candles is available, without glare, at the reading plane. Subdued blue light is provided for night use.

In the Pullman units, an adjustable lower-berth reading light is used for the first time, which permits the occupant to direct the light where it is most needed to meet the requirements of his particular position. A blue night light, within the fixture, is controlled by a double-throw toggle switch with a luminous tip. On the ceiling, a continuous combination direct-lighting fixture and air-conditioning distribution duct is used, running from one end of the car to the other. This also has blue night lights within it which are controlled by separate switches.

In the Pullman bedroom-observation unit, a semi-indirect louvered trough light is used, which is applied above the windows and continues completely around the interior. It is constructed so that 70 per cent of the illumination is thrown onto the reading plane, 20 per cent is reflected to the ceiling, and, for decoration, 10 per cent is directed through a blue-colored screen and reflected onto the face of the trough. It is interesting to note that this extruded aluminum trough is curved around the end of the car, which presented an unusual problem in manufacturing.

In the dressing rooms throughout the train, a new type of tubular fixture is used which provides effective lighting at the mirrors. These lighting fixtures are of Pullman Company design.

Train Control and Cab Signals

The locomotives of the "City of Denver" streamliners are equipped with a composite cab-signal and speed-

control system. This equipment, furnished by the Union Switch and Signal Company, is designed for operation on the Chicago & North Western between Chicago and Omaha, Neb., as a two-indication cab-signal system with two-speed control. On the Union Pacific, between North Platte, Neb., and Julesburg, Colo., the equipment functions as a two-indication cab-signal system with a warning whistle and acknowledging feature. The cab-signal apparatus is similar to that in service on steam locomotives on the Union Pacific lines. However, as with the "City of Portland," a new-type, compact, electric, speed governor is used in place of the older type governor used on steam locomotives.

The pneumatic equipment is of special design to provide the required train-control operating features in conjunction with the electro-pneumatic air-brake system designed for these high-speed trains. The air-brake equipment is so designed that the brakes can be operated either by straight air or by automatic air. Consequently, the train-control apparatus is designed to function under both the straight-air and the automatic-air systems. The train will be operated normally on straight air, but if a train-control application should be initiated at such time when the straight-air lines are not intact, a full service automatic-air application will be obtained without any action on the part of the engineman.

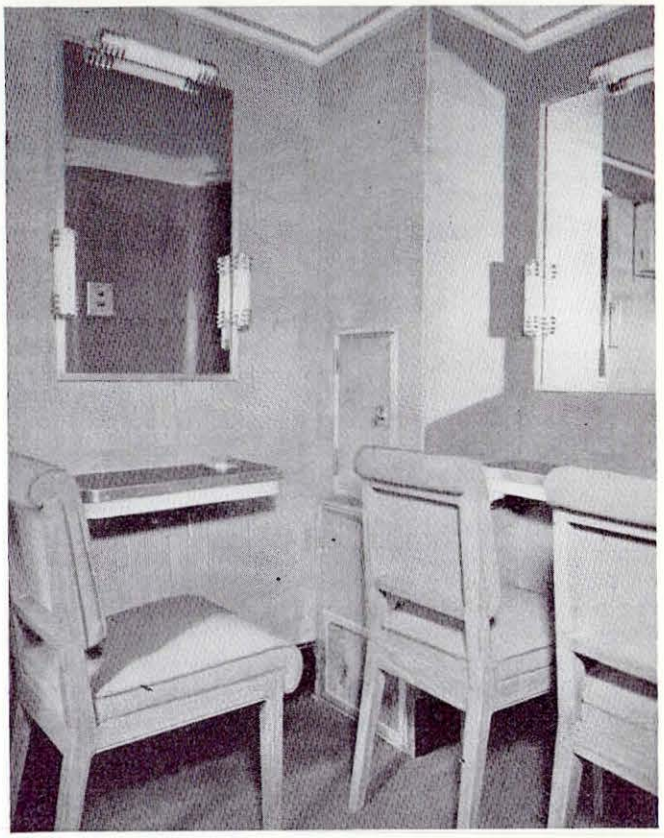
The Cab Equipment

The train-control cab equipment consists of the usual cab signal, two whistles, an acknowledging valve, a special circuit controller and a duplex air gage. The speed whistle, which has a high pitch, sounds when the speed limit is exceeded and can be silenced only by complying with the existing speed restriction. The acknowledging whistle, of low pitch, sounds when a restrictive indication is received and when recurrent acknowledgment is required. This whistle can be silenced by operating the acknowledging valve.

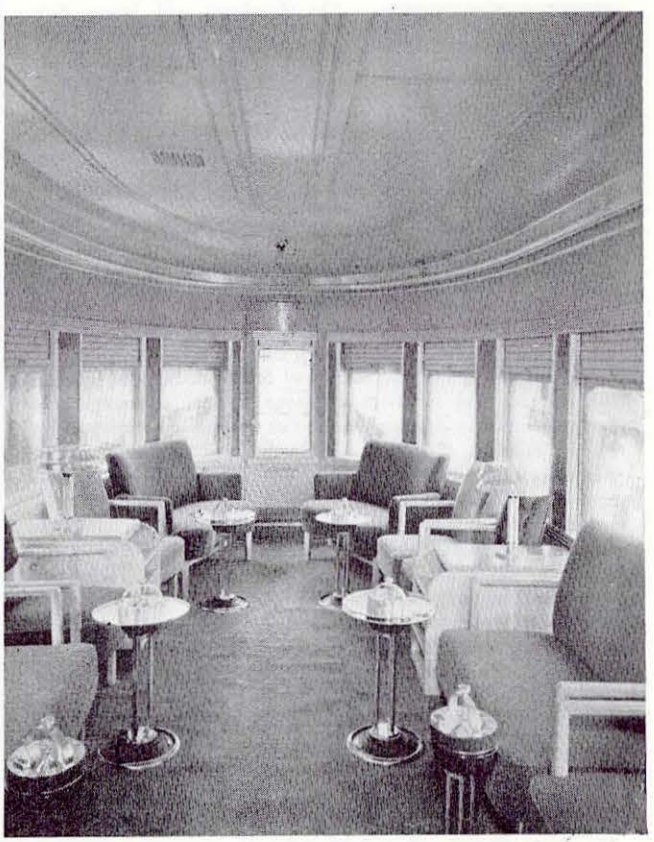
When a train-control application is received, the special circuit controller reduces the speed of the main driving engines to idling. If the application is caused by exceeding the speed limit, the brakes can be released immediately after the speed limit has been complied with. However, if the application is caused by failure of the engineman to acknowledge a restrictive indication, the brakes cannot be released for 60 seconds. In either case, the special circuit controller, which has set the main engines to idling speed, cannot be restored until the operating conditions have been complied with.

The equipment is arranged so that the engineman may at all times retain control of the train braking, provided proper action is taken to observe the prescribed speed limits. If the engineman takes no action, the train-control brake application is initiated eight seconds after the speed limit is exceeded, or after the signal changes to the more restrictive indication if the speed is above the low speed limit. However, the engineman may suppress this brake application by initiating a manual brake application prior to the expiration of the delay time and maintaining it until the speed is reduced to the prescribed speed limit.

The recurrent acknowledgment feature, furnished by this equipment, enforces acknowledgment at regular intervals when operating in a restricted block. With this arrangement, after a red-over-yellow cab-signal indication has been received and acknowledged, the acknowledging whistle will sound at recurring intervals of approximately 90 seconds, requiring acknowledgment to silence the whistle and to prevent an automatic brake application at the expiration of the delay time. The train-control apparatus is cut out while the train is in operation over the Union Pacific cab-signal territory as well as in ordinary automatic block signal territory.



Lighting Fixtures and Equipment in One of the Ladies' Dressing Rooms



The Rear End of the Observation-Lounge Room—The Lighting Is Semi-Indirect from the Louvered Trough at the Ceiling Line

Railway Supply Forces All Set For Annual Meeting

Prospects for large attendance bright as purchases increase and Federal Co-ordinator's activities end

AFTER much delay and uncertainty over plans, the Purchases and Stores division of the Operations and Maintenance department of the Association of American Railroads has completed plans for its annual meeting, to be held in the Palmer House in Chicago on July 9 and 10. This meeting will be the second annual gathering of railway purchasing and stores department officers and employees since the formation of the A.A.R., and will mark the 22nd anniversary of the founding of the Railway Storekeepers' Association. Committees got a late start this year, and differences of opinion regarding the kind of a meeting to be held kept the time and place of the meeting from being settled until June 4. Creditable progress has been made on the work of several committees, however, and a large attendance is assured.

The tentative program is as follows:

Convention Program

Thursday, July 9, 10 A. M. Eastern Standard Time

Meeting called to order.
Communications.
Appointment of Committees on Resolutions and Memorials.
Action on Minutes of 1935 Meeting.
Report of General Committee.
Address by Chairman, Charles B. Tobey, General Storekeeper, Lehigh Valley.

PRESENTATION AND DISCUSSION OF REPORTS

Subject 3—Classification, Handling and Sales of Scrap.
Subject 3A—General Reclamation.
Subject 2—Standard Material Classification.
Subject 4—Comparisons of Material Stock Reports and Material Store Expenses.
Subject 5—Forest Products.
Stores Group Meetings, by J. C. Kirk, assistant general storekeeper, Chicago, Rock Island & Pacific.
Subject 10—Forecasting Material Requirements of Purchased and Shop Manufactured stocks to Co-ordinate Procurement with Actual Needs.
Subject 11—Pricing and Inventory.
Subject 12—Purchasing Agents Organization, Practices and Office Records.

Friday, July 10, 9:30 A. M. Eastern Standard Time

Address—J. M. Symes, vice-president, Operations and Maintenance Department, Association of American Railroads.
Subject 13—Stationery and Printing.
Subject 14—Stores Department Fire Prevention.
Subject 16—Simplification and Standardization of Stores Stocks.
Annual Contest Papers.
Subject 28—Purchase of Special Devices and Commodity Purchases.
Subject 31—Material Guarantees—General Practice as to Guarantees—Failures, Methods of Handling, and Lists of Materials Covered by Specific Guarantees.
Subject 33—Stores Department Buildings and Facilities for Economical Handling of Materials.
Report of Resolutions Committee.
Report of Memorials Committee.
Report of Nominating Committee.
Election of Officers.

For several years the section has conducted an annual competition for papers for the purpose of stimulating interest among employees of railway supply departments in the objectives and responsibilities of the service. Franklin I. Kroesen, a clerk in the purchasing

The Purchases and Stores Division—A Special Statement to *Railway Age*

By J. M. Symes

Vice-President (Operations and Maintenance Department) Association of American Railroads

J. M. Symes

The Purchases and Stores division, Operations and Maintenance department, constitutes one of the most important divisions of the Association of American Railroads. The members of that division incur in the purchase, storage and distribution of the materials and supplies currently required for the production of transportation, approximately one-fourth of the total operating expenses of the railroads. Under normal conditions such expenditures exceed one billion dollars annually and include the purchase of nearly every commodity produced.

Not only must the Purchases and Stores division co-ordinate the methods and practices employed by the carriers in the purchase of these enormous quantities of materials and supplies by the railroads at the most favorable price possible, but it also must look after their storage and distribution in the most economical manner. Through research and standardization activities, the division has developed improvements resulting in marked financial savings to the railroads and an increase in the quality of the materials purchased.

By standardizing and simplifying methods of stock control, a substantial reduction has been brought about in the quantity of supplies of all kinds which the railroads are required to keep on hand. Since 1923, it is estimated that the inventory investment in materials and supplies has been reduced by approximately 50 per cent. When one considers that the railroads normally consume about 25 per cent of the total production of coal, steel and forest products, to say nothing of the enormous amounts of other materials and supplies which the railroads use each year, the importance of the Purchases and Stores division can best be realized.

agent's office of the Pennsylvania, and Herbert M. Hobson, a stockkeeper on the Louisville & Nashville, the winners in this year's competition, will present their papers in person at the annual meeting.

Review Work of Co-ordinator

Besides the work of the regular committees, the division has given study, since the last convention, to reports from the Federal Co-ordinator's office on railroad scrap, made public July 6, 1935; on mechanical equipment for handling material, made public October 20, 1935; on commissary supplies, issued January 6, 1936; on tie and timber treating plants, made public on April 15; and to correspondence on stores expense and secondhand material.

The scrap handling report*, prepared at much expense to the railroads, contained detailed statistics on the amount of scrap iron of different grades produced by railroads in 1933, the methods of preparing this scrap for sale, and the returns received from the sales, together with extensive data on the methods and equipment employed by the railroads for dismantling equipment. This report, to quote from the letter of transmittal, gave the railroads "something to shoot at" by concluding, among other things, that the railroads should prepare their scrap more completely and should eliminate the scrap dealer by selling direct to consumers.

The material-handling report† comprised a detailed analysis of the mechanical equipment in use on five railroads for trucking and otherwise handling store materials, with supplementary records on the comparative economies claimed for specific operations, and the conclusion was reached that over $1,000,000 in labor costs could be saved by a more complete introduction of material handling equipment by railroads.

The timber treating report compiled information on the location, equipment and production of various ties and timber treating plants serving the railroads, and again gave the railroads "something to shoot at" by concluding that railroads should eliminate all commercial operations and restrict timber preservation to company-owned facilities.

Unlike the foregoing reports, which were made public by the Co-ordinator, that prepared on commissary supplies, and also the report which has been prepared on stores expenses and the cost of secondhand material, were carried only through their preliminary stages and were not made public but were submitted to the A.A.R. Permission to publish the report on commissary supplies has been obtained in the last few days and it is reviewed elsewhere in this issue. The contents of the other report have not as yet been made public.

The Purchases and Stores division has not completed its studies of any of these reports and has done little in reviewing the information on material costs. It is also doubtful if action taken by the Purchases and Stores division will be disclosed in detail next week, for the principal reason that the division functions in such matters chiefly as an advisory body to the A.A.R. However, reference to these reports can hardly be avoided and the discussion concerning them is awaited with interest. Surmises are that the division cannot consistently oppose all the conclusions in the scrap report because several of its members are said to have assisted in preparing it, and committees have consistently advocated the super-grading of scrap, although others experienced in selling scrap will doubtless oppose the proposal to put the scrap dealers out of business.

It is no secret that the Co-ordinator's report on material handling has many friends in the division, in view of the frequency with which committees of the division in previous years have been urging the use of more tractors and trucks for handling material. Pending next week's meeting, most observers also believe that proposals to put the commercial tie plants out of business will be an alluring target for criticism.

General and Advisory Committees of the Purchases and Stores Division Making Final Convention Arrangements, at Chicago on May 20

Left to Right: H. E. Ray, C. H. Murrin, J. L. Bennett, E. J. Lamneck, L. P. Krampf, W. C. Atherton (representing the late W. J. Black), F. S. Austin, Julius Zysman, assistant to secretary, C. B. Tobey (chairman), W. J. Farrell, secretary, A. C. Mann, G. E. Scott, F. D. Reed, L. B. Wood, G. H. Walder, J. C. Kirk, H. M. Smith and A. L. Sorensen.

C. B. Tobey, Chairman

In charge of the division's work this year has been C. B. Tobey, general storekeeper, Lehigh Valley, as chairman, and W. J. Farrell, secretary, assisted by a general committee of elected members, as follows: E. A. Clifford, general purchasing agent, C. & N.W., vice-chairman; F. S. Austin, assistant purchasing agent N.Y.C.; J. L. Bennett, purchasing agent, Cent. of Ga.; W. G. Black*, vice-president, C. & O.; E. Harty, assistant general storekeeper, S.P.; J. C. Kirk, assistant gen-

* *Railway Age*, July 6, 1935.
† *Railway Age*, October 19, 1935.

* Deceased.

eral storekeeper, C.R.I. & P.; L. P. Krampf, supply agent, M.P.; E. J. Lamneck, purchasing agent, Penna.; A. C. Mann, vice-president, I. C.; C. H. Murrin, general storekeeper, L. & N.; G. E. Scott, purchasing agent, M-K-T; H. M. Smith, general storekeeper, N.P.; A. L. Sorensen, manager of stores, Erie; G. H. Walder, purchasing agent, C.M.St. P. & P; and L. B. Wood, general storekeeper, T. & N. O.

During the past two years, the section has also looked for direction from an advisory committee consisting of past-chairmen of the section, while a special purchasing committee also participated in directing the work of regular or special committees, as follows: W. C. Bower, vice-president, N.Y.C., chairman; C. E. Walsh, general purchasing agent, Penna.; A. W. Munster, vice-president, B. & M.; D. C. Curtis, chief purchasing officer, C. M. St. P. & P.; E. A. Clifford, general purchasing agent, C. & N. W.; J. L. Bennett, purchasing agent, C. of Ga.; and G. E. Scott, purchasing agent, M-K-T.

Many Sides to Supply Work

The program for the coming convention only partially discloses the role of the purchasing and stores forces in railway operation, the accomplishments claimed by the division and the problems which receive or require attention. Collectively, the railroads spend vast sums annually for new equipment, manufacturers' materials and fuel to replenish materials worn out in service and to operate and improve the properties. Expenditures for fuel and supplies purchased directly by the railroads totaled $1,329,000,000 in 1929 and over $500,000,000 in 1933 when buying was limited to the barest necessities. These purchases include raw materials, finished and semi-finished materials of all descriptions from tacks, towels and paper to ties, bridges, machinery, oils, gases and chemicals in 50,000 sizes and varieties. They are purchased throughout the year under diversified terms and conditions and require the maintenance of reserve stocks which totaled about $300,000,000 in 1935. In 1920, the figures were $767,000,000.

The details of obtaining, distributing and otherwise handling these materials without waste and undue expense, and also the details of those operations connected with the reduction of equipment to scrap and its final disposition by sale or reuse, are largely functions of the supply service. In the performance of these functions, the supply forces manage store rooms throughout the country, are large shippers and employers of labor, operate much mechanical equipment, dismantle cars and locomotives, operate reclamation plants, and engage in a legion of related activities. The service is far-flung and filled with opportunities daily for economies and loses, directly and indirectly, and it is with these economies and wastes as well as with the general administration of the supply service in all directions that the Purchases and Stores division is concerned.

Troublesome Period

As purchases began to decline in 1930 and drastic retrenchments in labor and other expenses became necessary, supply organizations were disturbed. Interest in the usual activities of the association waned as the depression deepened and the futility of preparing formal reports on topics of no immediate importance or value in meeting the emergencies facing every railroad became apparent. As a result, several standing committees of the division ceased to function. In the midst of this, there came in rapid succession, codes, state sales taxes, buying under PWA loans; and a Federal Co-ordinator of Transportation was appointed. An association with activities limited to the preparation of reports for information only was inadequate and the railway executives appointed special committees of purchasing officers to consider the codes and other specific problems arising out of the flood of emergency legislation enacted or proposed by Congress. Then came the creation of the Association of American Railroads, which placed the division under the Operations and Maintenance department of the A.A.R., and discontinued all direct dealing between the division and the Federal Co-ordinator's office.

Conditions Better

Compared to this period of confusion and perplexity, the last year has been relatively calm for the division. Scares of new legislation affecting railroad purchasing have arisen periodically, but the codes ran their course and the period of financing purchases with PWA loans, with their onerous rules passed. Recently, the Guffey bill, which was destined to increase fuel costs, was declared void and the reorganization of the A.A.R., while looked upon as a blow to the prestige of the supply service by some champions of an entirely independent supply division, is now welcomed by many observers for the better machinery it provides for increasing adherence to approved practices.

Three years ago, when codes were giving so much concern, the plan of holding informal meetings of purchasing officers and similar meeting of stores officers once every three months or oftener was created, and these meetings were continued as an integral part of the division's work. The rapidly increasing use of materials has dispelled anxieties about employment, and now the problems arising in connection with the Federal Co-ordinator's work have been removed. The combined effect of these changes has been to create a measure of optimism which has not prevailed for years, and which will doubtless be reflected in next week's supply meeting.

A Period of Adjustment

The job now facing the division, according to many observers, is the adjustment of committee work and policies to recapture the interest of numerous roads whose supply officers have grown indifferent to the association's work, and to serve more fully, if possible, the every-day needs of the railroads along definite lines. Many problems of co-ordination between the supply forces of individual roads and other departments await action, notwithstanding the conclusion of the Federal Co-ordinator's administration; and it must not be overlooked, add the observers, that the intention of the new A.A.R. to use the several divisions in effectuating standards, eliminating duplications and developing information for other purposes, imposes upon committees the exercise of special care in formulating rules and recommended practices for general adoption. There must be an end, it is said, to committee reports which are read and merely shelved.

This brings the Purchases and Stores division face to face with a problem of leadership that has been accentuated by the gradual retirement of many of its most active members. Concern is expressed by members over the question. Much interest, therefore, centers around the action of the division's nominating committee this year in selecting candidates for the chairmanship and vice-chairmanship and vacancies on the general and other elective committees. This committee consists of L. C. Thomson, manager of stores, C. N., (chairman); G. E. Scott, purchasing agent, M-K-T; E. G. Walker, general purchasing agent, A. T. & S. F.; A. W. Munster, vice-president, B. & M.; and C. L. Wakeman, general storekeeper, Wabash.

Railway Buying $450,000,000 in Six Months

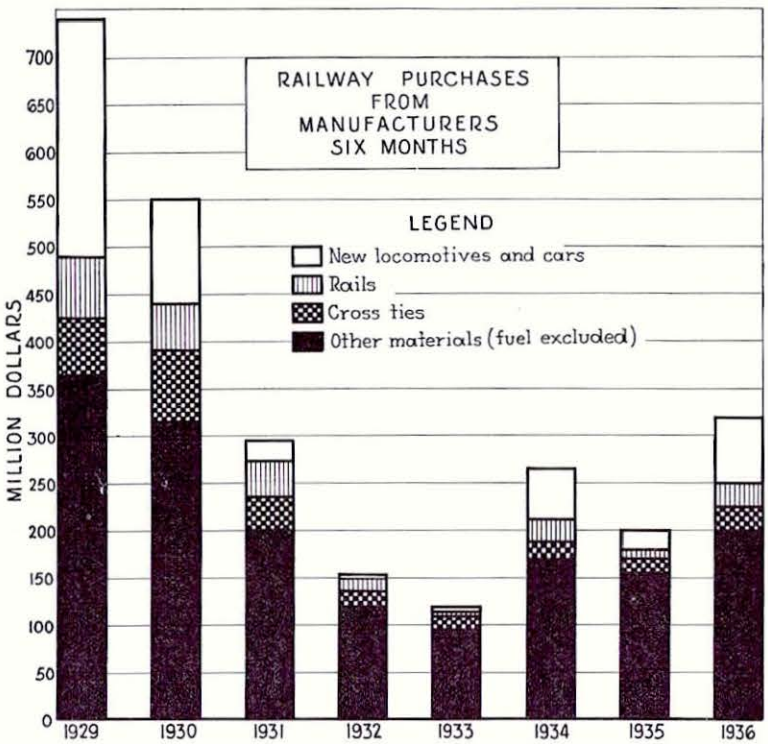
Total purchases from manufacturing industry $322,000,000, an increase of 60 per cent over 1935

THE most spectacular increase in railway purchasing since the beginning of the depression was made in the first six months, of this year, according to figures compiled by the *Railway Age*. The steam railroads of the United States, strengthened by better earnings, have been exerting powerful forces toward the restoration of employment by turning loose the largest flood of orders for supplies in any equal period in five years and by releasing more orders for equipment in six months than were placed in any twelve-month period in six years. These orders are being financed almost entirely out of earnings and show no signs of a letup.

Purchases from Manufacturers—First 6 Months*

	Supplies less fuel (000)	New Equipment (000)	Total (000)
1929	$487,601	$249,870	$737,471
1930	436,283	113,782	550,065
1931	272,859	21,795	294,654
1932	150,450	1,830	152,280
1933	113,890	3,372	117,262
1934	210,686	55,187	265,873
1935	180,750	20,987	201,737
1936	250,379	71,340	321,719

* Estimates based on special reports from the railroads.



A Comparison of the Purchases of Materials Made by the Railroads from Manufacturers and the Value of Locomotives and Cars Ordered by the Railroads from Manufacturers During the First Six Months of Each Year

$322,000,000 from Manufacturers

The summaries of expenditures which have been prepared, combine the purchases made by the railroads for materials with the orders placed with manufacturers for new locomotives and cars. Equipment orders on railroad shops are excluded to avoid duplications in the purchases of materials. While the purchases made by the railroads for materials were not completely reported for the months of May and June when the six months' totals were computed, estimates based on all reports available to date indicate that the total purchases made by the railroads during the last six months for materials, equipment and fuel approximated $451,650,000. In this total are expenditures of $249,916,000 for materials received from manufacturers and $71,340,000 for cars and locomotives ordered from manufacturers—a total from manufacturers of $321,256,000. The purchases for coal and fuel oil totaled $131,603,000. The overall total includes the orders for $16,000,000 of new locomotives and cars placed by the Van Sweringen lines in May and the $9,000,000 orders placed late in June by the Southern Pacific; also four light-weight passenger trains ordered by the Burlington and two light-weight passenger trains ordered by the Union Pacific since the first of the year. Purchases by contractors of engineering work are not included in the total; neither are the value of contracts pending for locomotives and cars, or the purchases of materials and equipment made in this country by railroads of Canada and Mexico.

Dollar for dollar, the purchases of supplies from manufacturers, (exclusive of equipment) were 40 per cent, or $70,000,000 greater than in the first six months of 1935; an increase of $136,000,000, or 120 per cent, over the same period of 1933; and within $22,000,000, or 8

Purchases of Material and Supplies—Class I Roads

	Fuel		Rail		Cross Ties	
	1936 (000)	1935 (000)	1936 (000)	1935 (000)	1936 (000)	1935 (000)
January	$21,170	$20,800	$1,093	$965	$2,860	$2,080
February	23,554	21,050	2,390	1,540	2,266	2,300
March	21,860	25,500	4,019	1,590	3,190	3,240
April*	20,295	18,000	5,010	1,780	3,821	4,060
May*	22,362	18,400	2,018	2,140	4,017	3,440
Five months	109,241	103,750	14,530	8,015	16,154	15,120

	Other Material		Total		Total Less Fuel	
	1936 (000)	1935 (000)	1936 (000)	1935 (000)	1936 (000)	1935 (000)
January	$28,814	$21,605	$53,937	$45,450	$32,767	$24,650
February	28,288	21,310	56,498	46,200	32,944	25,150
March	35,914	26,420	64,985	56,750	43,125	31,250
April*	37,611	29,360	66,739	53,200	46,444	35,200
May*	41,282	27,220	69,681	51,200	47,318	32,800
Five months	171,909	125,915	311,840	252,800	202,598	149,050

* Subject to revision.

per cent, of the figure for 1930. The purchases of equipment arranged with builders (exclusive of equipment to be built in railroad shops) since January 1, were $50,000,000 larger, or two and one-half times more than the total in the same six months of last year, and an increase of $16,000,000, or 30 per cent, over the corresponding figure for 1934 when the purchase of cars and locomotives was stimulated by PWA and RFC loans. They were greater by $50,000,000, or 120 per cent, than the corresponding figure for 1931. Counting both materials and equipment purchased from manufacturers, the total business done with manufacturers since January 1, was an increase of $120,000,000 or 60 per cent above the total for the first six months of 1935; an increase of $56,000,000, or 20 per cent above the corresponding figure for 1934; an increase of $215,000,000, or almost double the figure for 1933; an increase of $27,000,000, or almost 10 per cent above the six months' total of 1931. The totals for this year to date, however, are still 50 per cent below the corresponding purchases in 1929 and the average of the five years previous to 1929.

Equipment Orders Soar

Counting equipment to be built in railroad shops as well as equipment to be manufactured in builders' plants, orders were placed during the past six months for 122

Purchases—Materials and Fuel—4 Months

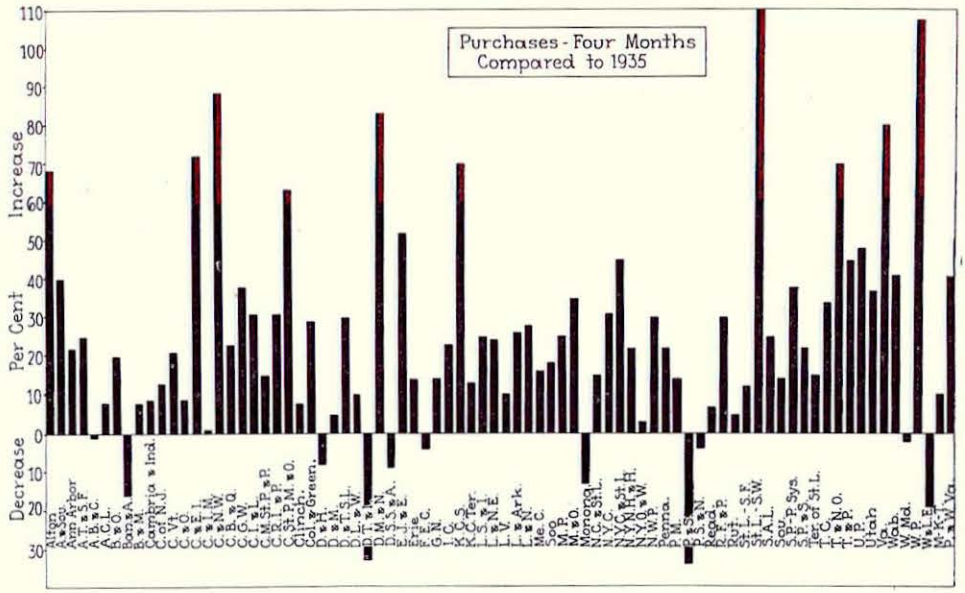
	1936	1935	1934	1933
Alton	$1,431,259	$853,766	.....	$560,672
Alton & Sou.	72,321	52,028	$61,126	.....
Ann Arbor	345,369	283,454	236,852	169,308
A. T. & S. F.	12,790,862	10,220,677	7,571,949	6,011,175
A. B. & C.	264,631	266,520	251,686	155,367
A. C. L.	3,223,123	2,975,313	3,190,349	1,789,333
B. & O.	8,129,290	6,753,921	6,045,501	2,965,144
Bangor & Aroos.	492,086	588,586	513,742	343,070
Bingham & Gar.	98,709	39,793	.....	.....
B. & M.	2,656,608	2,470,208	4,160,364	1,788,032
Cambria & Ind.	44,421	40,726	.....	.....
C. of G.	1,289,975	.....	985,260	555,162
C. of N. J.	1,757,764	1,558,033	1,511,728	1,344,274
Cent. Vt.	492,827	408,846	402,642	308,005
C. & W. C.	127,193	192,855	138,582	.....
C. & O.	4,676,927	4,289,314	3,473,691	2,628,111
C. & E. I.	1,119,319	649,790	882,411	430,418
C. & I. M.	187,334	186,878	174,599	135,839
C. & N. W.	7,534,221	3,992,742	5,933,136	3,408,941
C. B. & Q.	6,125,269	4,984,855	5,096,936	3,394,152
C. G. W.	1,397,032	1,009,907	955,664	855,028
C. I. & L.	513,073	377,411	.....	.....
C. R. I. & P.	5,387,845	4,081,422	3,681,460	2,459,184
C. St. P. M. & O.	1,731,184	1,042,918	1,080,973	920,343
Clinchfield	391,202	361,409	333,073	.....
Col. & Green.	93,562	72,661	77,315	43,159
D. & H.	1,723,363	1,865,866	2,114,097	1,389,421
Detroit & Mack.	58,448	55,401	.....	.....
D. & T. S. L.	181,606	140,689*	.....	.....
D. L. & W.	3,143,147*	2,886,864	2,547,823	2,107,265
D. T. & I.	335,620	503,451	265,619	100,828
D. & R. G. W.	.....	1,186,049	.....	704,033
D. M. & N.	597,477	347,394	377,999	125,890
D. S. S. & A.	153,398	167,458	157,820	98,654
E. J. & E.	852,651	561,066	483,046	219,742
Erie	4,025,204	3,547,607	3,836,502	2,443,250
F. E. C.	588,957	615,624	429,863	372,894
Ft. S. & W.	39,477	34,212	49,827	.....
G. N.	4,242,200	3,720,429	3,535,198	2,304,537
I. C.	6,709,190	5,475,964	5,327,473	3,748,782
K. C. S.	911,113	537,025	786,569	336,345
K. C. Term'l.	269,126	237,616	.....	.....
L. S. & I.	36,471	29,000	39,121	9,086
L. & N. E.	$222,637	$179,081	$297,888	$128,772
L. V.	3,215,427	2,926,723	.....	.....
L. & A.	492,329	388,938	194,670	120,187
L. & N.	5,787,822	4,518,625	3,504,821	2,193,388
Me. C.	1,056,186	905,921	933,436	566,169
Soo	1,689,537	1,427,055	1,559,199	1,160,310
Mo. & Ark.	52,375	.....	.....	.....
M-K-T	1,294,361	1,175,396	1,713,075	717,544
M. P.	8,170,379	6,268,396	6,842,210	2,951,855
M. & O.	659,326	485,833	509,723	330,844
Monongahela	115,637	149,213	.....	.....
Montour	112,284	.....	162,272	.....
N. C. & St. L.	1,100,363	948,973	960,956	730,561
Nev. Nor.	47,237	37,348	.....	.....
N. Y. C.	24,901,618	19,064,296	17,402,497	12,355,869
N. Y. C. & St. L.	2,274,322	1,560,506	1,546,704	1,152,718
N. Y. N. H. & H.	4,339,730	3,535,665	3,990,990	1,800,233
N. Y. O. & W.	605,992	585,784	.....	.....
N. W. P.	138,672	108,802	109,530	116,278
Penna.	20,428,065	16,855,319	17,482,340	11,517,034
Penna.-Read. S. S.	125,891	127,354	.....	.....
P. & P. U.	146,991	107,502	.....	.....
P. M.	1,966,661	1,729,755	1,548,327	1,136,288
P. & S.	26,742	40,236	39,688	30,433
P. & W. Va.	174,343	123,220	109,463	25,975
P. S. & N.	49,916	51,442	111,508	31,473
Reading	2,891,022	2,723,628	2,820,449	1,981,242
R. F. & P.	655,582	499,369	435,448	434,002
Rutland	223,524	214,085	.....	172,682
St. L.-S. F.	3,647,466	3,270,192	3,701,738	2,257,612
St. L.-S. W.	1,330,650	628,140	440,700	278,167
S. A. L.	2,942,141	2,374,989	3,434,819	.....
Southern	7,136,145	6,273,394	5,957,552	2,849,092
S. P.	8,790,358	6,366,954	7,210,255	3,440,182
S. P. & S.	426,517	350,145	.....	.....
Term'l of St. L.	490,838	427,604	.....	.....
Tenn. Cent.	188,142	140,071	154,218	110,892
T. & N. O.	2,839,788	1,670,290	1,647,792	862,982
T. & P.	2,022,030	1,393,509	1,139,282	709,272
U. P.	11,871,006	7,980,069	7,446,370	5,253,689
Utah	55,581	40,659	20,431	28,207
Virginian	1,090,330	598,605	527,015	.....
Wabash	2,935,218	2,062,001	2,344,794	1,285,360
W. Md.	1,147,748	1,186,418	.....	468,238
W. P.	1,993,000	953,750	628,000	585,600
W. & L. E.	973,187	1,203,179	884,409	270,171

*April estimated. Totals missing where none shown.

Equipment and Rail Orders for First Six Months of 1936*

	Locomotives	Frt. Cars	Pass. Cars	Rail, Tons
Alton & Southern	1	....	..	....
A. T. & S. F.	..	550	8 [2]	58,573
A. C. L.	..	....	..	6,000
B. & O.	..	....	..	25,000
Bangor & Aroostook	..	50	..	....
Belt Ry. of Chicago	..	....	..	800
Bessemer & Lake Erie	14	2,000	..	....
Bd. of Pub. Serv. St. L.	..	....	..	660
Boston & Maine	3 [4]	....	..	....
Cal. Disp. Line	..	5	..	....
Chesapeake & Ohio	..	5,400	..	20,000
C. & E. I.	..	....	..	6,000
C. & N. W.	..	....	..	51,000
C. B. & Q.	7 [1]	1,000	32 [2]	....
C. I. & L.	..	....	..	1,000
C. M. St. P. & P.	1	1,750	37	28,000
C. R. I. & P.	..	....	..	3,000
Cornwall Ry.	..	20	..	....
Delaware & Hudson	..	50	..	....
D. & R. G. W.	..	....	..	10,000
Erie	..	800	..	18,099
Gen. Am. Trans. Co.	..	250	..	....
Great Lakes Steel Corp.	1	....	..	....
Great Northern	..	500	..	....
Green Bay & Western	..	....	..	3,460
Gulf, Mobile & Nor.	..	....	..	4,439
Illinois Central	..	....	..	7,600
Joplin-Pittsburgh	1 [3]	....	..	....
Kansas City Southern	..	....	..	4,000
Kansas, Okla. & Gulf	..	....	..	5,700
LaSalle & Bureau Co.	1 [3]	....	..	....
Lehigh & New England	1	....	..	....
Lehigh Valley	..	250	..	....
Chas. Lennig & Co.	..	2	..	....
Louisiana & Arkansas	5	....	..	....
Merchants Dispatch	..	500	..	....
Missouri Pacific	..	2,300	..	27,000
Mobile & Ohio	..	....	..	300
N. C. & St. L.	..	....	..	3,425
New York Central	7 [4]	....	..	38,000
N. Y. C. & St. L.	..	777	..	6,800
N. Y. N. H. & H.	10	....	50	....
Norfolk & Western	5	1,000	..	20,000
Northern Pacific	12	250	..	....
Pacific Fruit Express	..	2,700	..	....
Panama Canal	..	6	..	....
Pere Marquette	..	500	..	....
Portland Terminal	3 [4]	....	..	....
Phillips Petroleum	..	10	..	....
St. Louis-San Francisco	..	....	..	17,600
St. Louis Southwestern	..	....	..	1,500
Seaboard Air Line	1	100	..	8,560
Shell Chemical	..	15	..	....
Southern	..	....	..	6,700
Southern Pacific	18	2,820	..	40,769
Union (Pitts.)	10	1,000	..	....
Union Pacific	15	....	..	....
Wabash	..	....	..	10,000
Western Maryland	..	....	..	3,000
Western Pacific	..	100	..	31,000
Wheeling & Lake Erie	..	1,050	..	2,500
Weyerhauser Timber	..	75	..	....

* Incomplete.
[1] Includes power units for 4 streamlined trains.
[2] Car units in streamlined trains.
[3] Propane-Electric.
[4] Diesel-Electric.



Expenditures for Materials and Fuel by Railroads, First Four Months, 1936, Compared with Corresponding Expenditures in 1935 —Equipment Excluded

locomotives, 26,560 freight cars, and 149 passenger train cars, while the orders placed on mills for rail during the six months' period amounted to 470,485 tons. The number of locomotives ordered is almost one and one-half times the number ordered throughout 1935 and is only 26 locomotives short of the total number ordered in the first six months of the entire past four years. The number ordered during the first six months was 46 in 1935; 78 in 1934; 20 in 1933; and 4 in 1932. The corresponding figure was 126 in 1931, 289 in 1930, and 594 in 1929. Of the total number of locomotives ordered thus far in 1936, 104 were steam locomotives and the others electric or gas-electric locomotives. Orders for steam locomotives amounted to 28 in 1935, 72 in 1934, 17 in 1933, 5 in 1932, and 62 in 1931.

Domestic Equipment and Rail Orders

	Locomotives		Freight Cars		Passenger Cars		Rail Tons	
	6 Mos.	12 Mos.	6 Mos.	12 Mos.	6 Mos.	12 Mos.	6 Mos.	12 Mos.
1929	594	1,224	67,167	111,321	1,142	2,320	291,864	2,049,710
1930	289	421	33,731	45,731	417	648	232,065	849,314
1931	126	233	7,792	10,826	5	11	511,978	678,584
1932	4	12	429	1,968	30	39	173,069	217,918
1933	20	42	533	1,686	4	6	97,954	332,316
1934	78	185	23,735	24,610	332	388	476,377	524,883
1935	46	81	7,108	18,699	59	63	263,756	499,948
1936	122		26,560		149		470,485	

Orders on builders' plants and railroad shops for freight cars are over three times greater than the number ordered in the first half of 1935 and also exceed every yearly total since 1930. The total number of freight cars ordered during the first six months of previous years was 7,108 in 1935; 23,735 in 1934; 533 in 1933; 429 in 1932; 7,792 in 1931; and 33,731 in 1930. The annual totals were 18,699 in 1935; 24,610 in 1934; 1,686 in 1933; 1,968 in 1932; 10,826 in 1931; and 45,731 in 1930.

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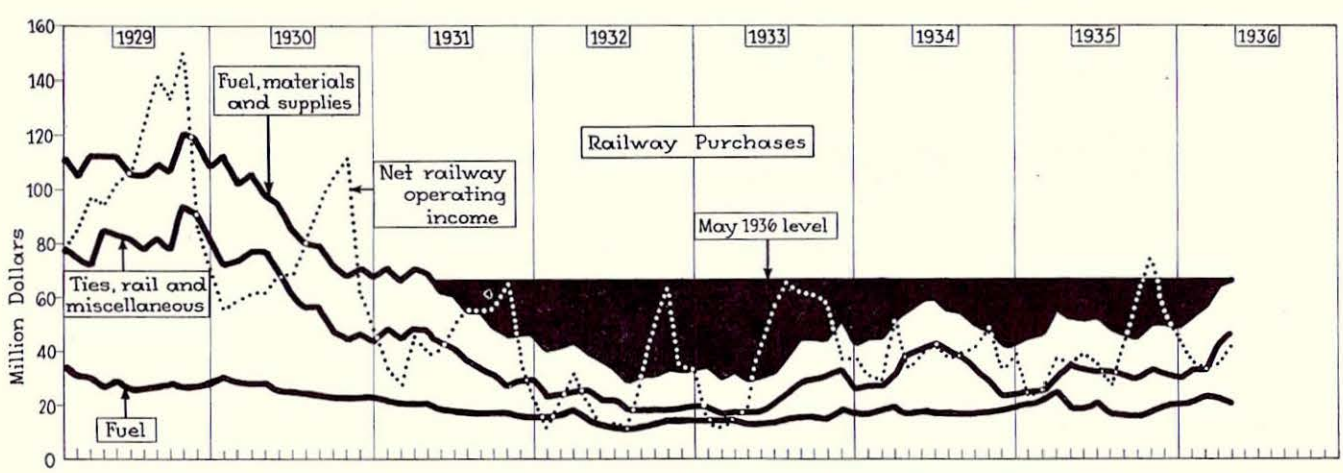
Almost 500,000 Tons of Rail

To date orders are known to have been placed on mills in this country for 470,485 tons of rail. This is twice as much rail as was ordered during the first six months of either 1935, 1930 or 1929, and is the largest six months' total in eight years, with the exception of 1931 and 1934. The tonnage ordered since January 1 is more than double that ordered in the entire year 1930, is half again as large as the tonnage ordered in 1933, lacks only 20,000 tons of equaling the total for all of



Trend of Purchases of Materials and Fuel, Exclusive of Equipment, Made by the Railroads Month by Month Since January, 1930

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Nine Companies Lead Car Buying

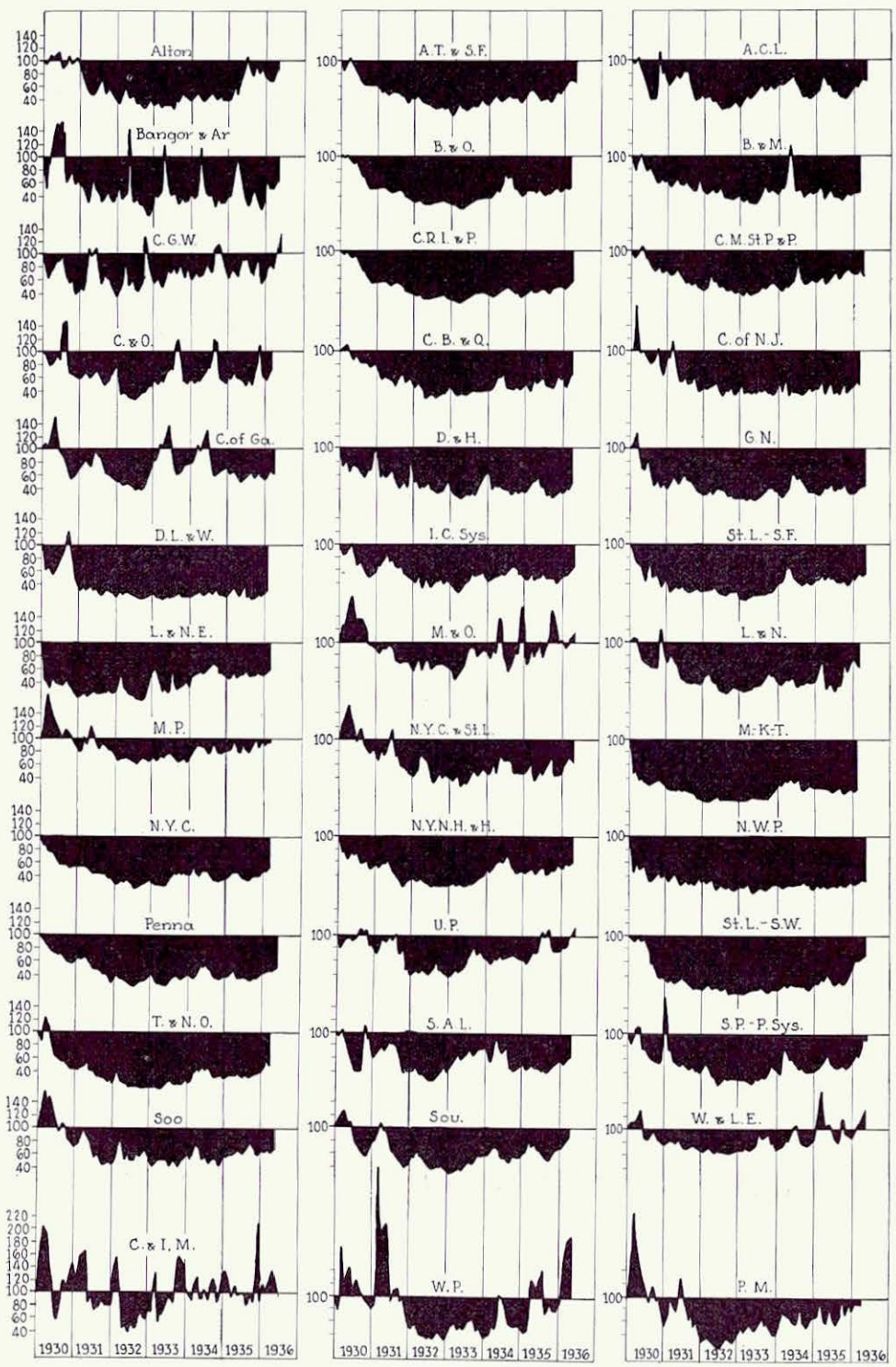
Nine railroads have ordered 1,000 or more freight cars since January 1. The Bessemer & Lake Erie ordered 2,000; the Chesapeake & Ohio, 5,400; the Chicago, Burlington & Quincy, 1,000; the Chicago, Milwaukee, St. Paul & Pacific, 1,750; the Missouri Pacific, 2,300; the Norfolk & Western, 1,000; the Pacific Fruit Express, 2,700; the Southern Pacific, 2,820; and the Union of Pittsburgh, 1,000.

Orders for 10,000 or more tons of rails were placed by 14 roads, not counting roads which placed heavy orders last November and December for delivery this year. The Atchison, Topeka & Santa Fe ordered 58,500 tons; the Chicago, Burlington & Quincy, 25,000 tons; the Chesapeake & Ohio, 20,000 tons; the Chicago & North Western, 51,000 tons; the Chicago, Milwaukee, St. Paul & Pacific, 28,000 tons; the Denver & Rio Grande Western, 10,000 tons; the Erie, 18,000 tons; the Missouri Pacific, 27,000 tons; the New York Central, 38,000 tons, the Norfolk & Western, 20,000 tons; the St. Louis-San Francisco, 17,600 tons; the Southern Pacific, 40,769 tons; the Wabash, 10,000 tons; and the Western Pacific, 31,000 tons.

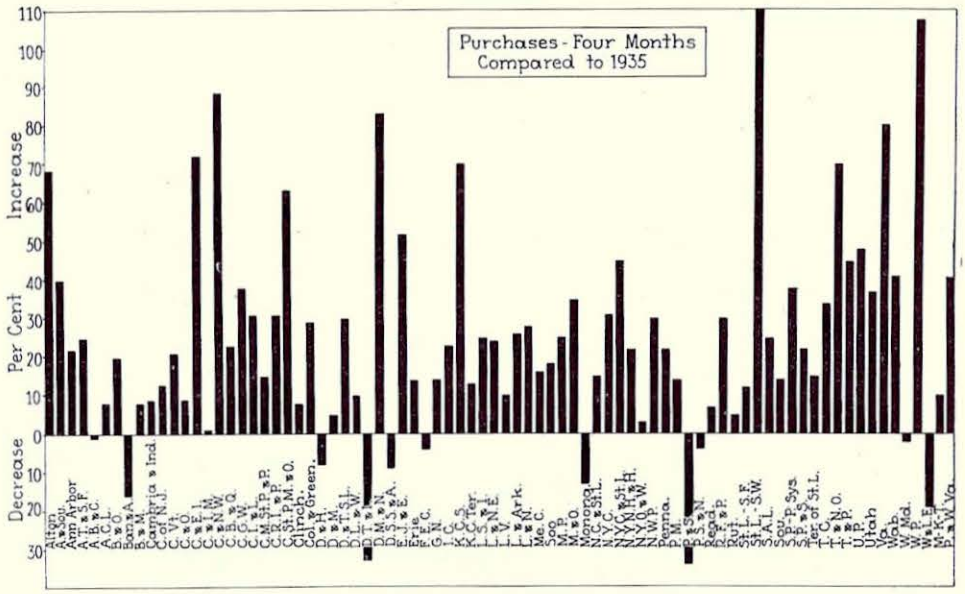
May Purchases Best in 60 Months

In May of this year, the latest month for which definite figures of this kind are available, purchases of materials from manufacturers (exclusive of equipment) totaled $47,750,000. This total was $12,000,000, or 50 per cent, larger than in January of this year or than in May, 1935. Expenditures for materials have increased every month since last September, the total for May being the largest recorded since May, 1931. The increase since April, 1933, when purchasing was at its lowest level, is approximately $28,000,000, or more than 150 per cent. While the totals are still well below the pre-depression levels, they mark a rapidly rising volume of buying as compared with the corresponding totals for 1931 and 1930 when buying was falling rapidly. The reviving effect of this year's buying on business and the confidence necessary to business, therefore, are positive, especially as the increased volume of railway buying continues during an election year.

From all sections come evidences of the expansion in railway buying. Of 72 railroads reporting complete figures for four months, expenditures for materials, including fuel, were larger on 61 than in the first four months of 1935 and lower on only 11 roads. The increases ranged from 5 per cent to more than 100 per



Purchases of Materials and Fuel by Selected Railroads Monthly from January, 1930, to May, 1936. January, 1930, Equals 100. Equipment Excluded



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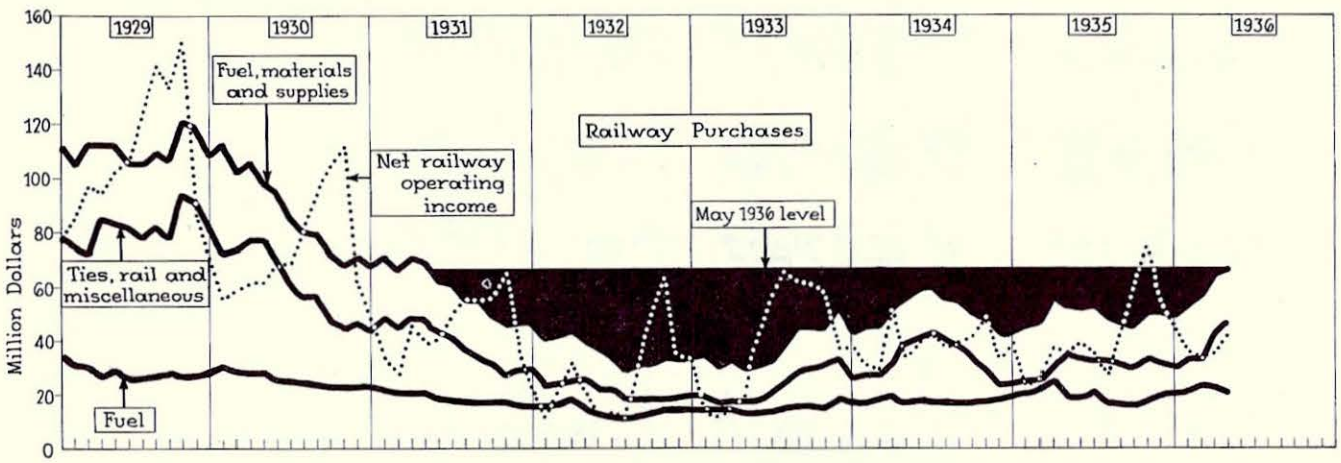

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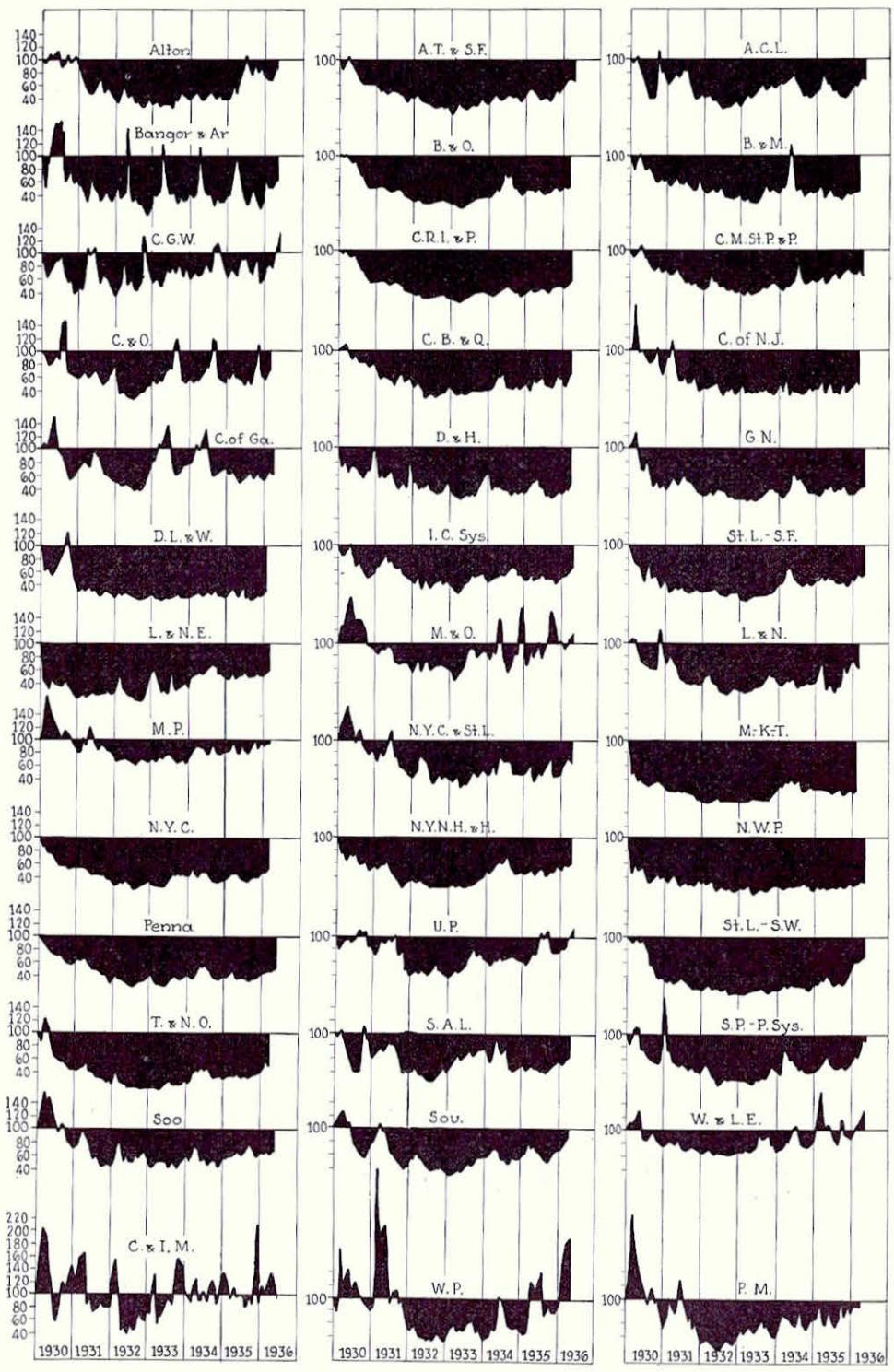


Purchases of Materials and Fuel by Selected Railroads Monthly from January, 1930, to May, 1936. January, 1930, Equals 100. Equipment Excluded

cent. There was an increase of $577,000, or 68 per cent, on the Alton; of $469,000, or 72 per cent, on the Chicago & Eastern Illinois; of $3,542,000, or 89 per cent, on the Chicago & North Western; of $1,140,000, or 23 per cent, on the Chicago, Burlington & Quincy; of $1,430,000, or 24 per cent, on the Chicago, Milwaukee, St. Paul & Pacific; of $1,306,000, or 32 per cent, on the Chicago, Rock Island & Pacific; of $689,000, or 65 per cent, on the Chicago, St. Paul, Minneapolis & Omaha; of $521,000, or 14 per cent on the Great Northern; of $1,233,000, or 23 per cent, on the Illinois Central; and $1,269,000, or 28 per cent on the Louisville & Nashville. The increase was $5,837,000, or 31 per cent, on the New York Central Lines; $804,000, or 22 per cent, on the New York, New Haven & Hartford; $3,572,000, or 22 per cent, on the Pennsylvania; $567,000, or 25 per cent, on the Seaboard Air Line; $862,000, or 14 per cent, on the Southern; $2,423,000, or 38 per cent, on the Southern Pacific; $1,169,000, or 70 per cent, on the Texas & New Orleans; $628,000, or 45 per cent, on the Texas & Pacific; $3,890,000, or 48 per cent, on the Union Pacific; $490,000, or 80 per cent, on the Virginian; $873,000, or 41 per cent, on the Wabash; and $1,039,000, or 109 per cent, on the Western Pacific. Orders placed for locomotives and cars are not included in these increases.

Total Materials and Supplies on Hand

	Fuel (000)	Cross Ties (000)	Rail (000)	Other Material (000)	Scrap (000)	Total (000)
May 1, 1936.....	$25,064	$44,084	$36,741	$185,971	$7,666	$299,528
Jan. 1, 1936.....	22,818	42,020	34,275	171,920	9,427	279,926
May 1, 1935.....	24,600	54,000	37,500	182,200	7,500	305,800
Jan. 1, 1935.....	19,930	47,297	36,895	181,455	11,890	297,467

Materials and Supplies on Hand—May 1

	Rail—New & S. H.		Cross Ties		Other Material less fuel	
	1936	1935	1936	1935	1936	1935
Alton	$534,135	$142,237	$185,317	$235,720	$493,717	$542,657
Alton & Sou.	8,828	5,019	5,356	1,060	38,230	38,165
Ann Arbor	13,963	17,837	37,342	20,062	185,561	172,696
A. T. & S. F.	3,729,484	3,830,254	1,097,989	1,015,997	11,045,838	12,370,394
A. C. L. ...	115,382	411,161	90,582	132,743	1,965,338	1,692,143
B. & O.....	350,814	1,183,211	1,441,908	1,807,016	5,456,156	6,000,756
Bang. & Ar.	72,608	122,175	104,573	96,255	543,984	592,990
Bing. & Gar.	37,651	21,418	29,467	19,374	60,296	48,633
B. & M. ...	554,848	679,800	1,374,254	1,450,591	2,549,962	2,693,162
Camb. & Ind.	7,109	5,861	4,768	6,788	39,880	40,704
Cent. of Ga.	102,416	.....	269,776	.....	701,450	.....
Cent. of N. J.	96,124	166,640	202,832	264,959	1,066,000	1,071,648
Cent. Vt...	38,197	82,062	129,848	56,973	325,589	299,761
C. & W. C..	1,210	96,089	11,395	27,750	141,297	95,721
C. & E. I..	249,779	11,978	166,595	105,968	485,670	391,793
C. & I. M..	.....	25,132	2,446	24,324	215,781	248,949
C. & N. W..	1,819,687	1,477,357	1,957,535	1,326,818	5,313,143	4,005,670
C. B. & Q..	904,168	921,464	2,428,722	2,610,841	3,922,448	4,366,057
C. G. W....	85,673	29,320	183,476	120,554	557,753	359,177
C. I. & L. ..	53,047	91,267	65,286	86,445	530,556	541,237
C. R. I. & P.	333,125	230,326	440,182	454,895	3,968,772	3,897,038
C.St.P.M.&O.	104,300	107,418	393,479	344,966	691,630	583,105
Clinch.	31,823	59,846	152,644	63,413	268,397	296,957
Col. & Green	4,124	4,835	1,005	1,007	106,951	108,827
Del. & Hud..	196,419	200,747	276,411	353,904	1,394,029	1,615,012
Det. & Mack.	21,558	9,832	39,185	31,164	135,910	126,239
Det.&Tol.S.L	4,239	10,806*	19,560	35,735*	72,453	*56,130
D. T. & I..	25,652	127,070	88,170	113,741	324,729	341,858
D. M. & N..	82,866	85,476	235,750	269,400	536,227	479,397
D. S. S. & A.	89,766	62,569	41,455	49,487	188,850	204,457
E. J. & E..	57,727	69,058	129,396	62,888	614,098	824,102
Erie	232,899	190,996	996,013	1,139,861	1,969,210	1,780,569
F. E. C....	101,216	112,089	56,673	53,674	1,107,069	1,113,505
Ft. S. & W..	5,408	4,688	3,419	8,759	152,239	167,028
G. N.	696,361	883,019	1,475,898	1,655,597	4,009,154	3,689,700
I. C.	161,299	64,464	984,690	1,382,306	4,887,141	5,073,594
K. C. S.	40,397	.....	285,466	.....	511,106	.....
K. C. Term.	9,858	5,863	17,336	20,584	120,811	115,778
L. S. & I. ..	85,456	15,939	12,249	16,086	130,007	98,737
L. & N. E..	55,444	99,123	27,773	37,095	196,940	216,647
L. Val.	214,346	173,488	307,155	370,568	1,970,365	2,200,366
L. & A.	153,832	86,160	153,258	197,085	411,470	317,357
L. & N.	840,957	1,555,633	1,786,169	2,071,564	2,071,564	5,173,509
M. C.	146,085	151,757	264,125	241,940	967,461	1,074,765
Soo	91,284	172,081	607,111	485,496	1,129,557	1,210,268
Mo. & Ark..	1,285	9,047*	1,036	4,994*	48,553	*96,299
M-K-T	220,597	353,892*	340,231	448,866*	1,381,244	*1,576,238
Mo. Pac. ..	784,389*	814,116	1,528,164*	1,488,839	6,160,765*	6,539,644
M. & O. ...	47,310	130,742	22,650	19,692	585,833	463,916
Monong.	16,192	39,848	16,356	31,942	182,564	237,684
Montour ...	6,908	.....	970	.....	145,766	.....
N. C. & St. L.	194,710	.....	221,291	.....	933,927	.....
Nev. Nor. ..	4,906	7,371	16,326	20,219	60,606	60,856
N.Y.N.H.&H.	1,073,228	1,361,531	408,263	612,603	3,543,249	4,265,538
N. Y. O. & W.	84,779	119,016	72,994	155,326	412,761	428,369
N. W. P...	46,013	49,607	20,519	26,432	90,799	115,467
P. & P. U..	13,660	18,528	21,965	30,533	92,133	89,495
P. & S.	21,174	2,799	4,507	9,328	63,198	71,361
P. & W. Va.	27,136	22,831	22,664	20,100	78,783	59,447
P. S. & N..	10,697	14,739	12,568	4,798	68,403	79,940
Read.	713,897	789,561	456,492	560,653	3,461,172	3,478,377
R. F. & P. ..	In O. M.		In O. M.		697,082	689,418
Rutland ...	31,612	30,675	60,575	74,550	194,258	222,940
St. L.-S. F..	447,963	525,938	559,412	657,533	2,838,517	3,042,725
St. L. S. W.	95,298	85,693	107,059	81,905	741,963	636,900
S. A. L. ...	549,918	675,578	174,867	411,404	2,225,808	2,045,012
Sou.	630,685	512,743	678,039	529,500	3,743,372	3,522,323
S. P.	1,634,807	1,700,227	1,347,419	1,774,895	4,313,719	4,951,951
S. P. & S..	48,628	102,612	25,620	40,011	327,487	308,553
Ter. of St. L.	8,465	47,490	2,745	16,038	310,002	318,036
Tenn. Cent.	.....	.....	12,084	17,395	177,701	169,210
T. & N. O..	672,465	750,511	339,911	497,559	2,104,545	2,140,222
T. & P. ...	313,865	68,406	246,402	206,967	2,096,930	1,846,079
U. P.	2,817,465	2,531,127	2,114,367	1,910,787	12,104,463	10,271,950
Utah	26,100	28,281	38,474	29,336	143,160	.....
Virginian ..	174,112	159,902	143,986	188,283	1,226,485	1,116,567
Wabash	484,752	171,044	453,173	376,426	1,272,667	1,049,584
W. Md.....	4,847	15,141	452,116	304,669	835,263	1,230,830
W. P.	351,400	209,200	104,650	70,380	1,859,658	1,421,620
W. & L. E..	239,853	181,350	150,089	112,319	658,985	746,944

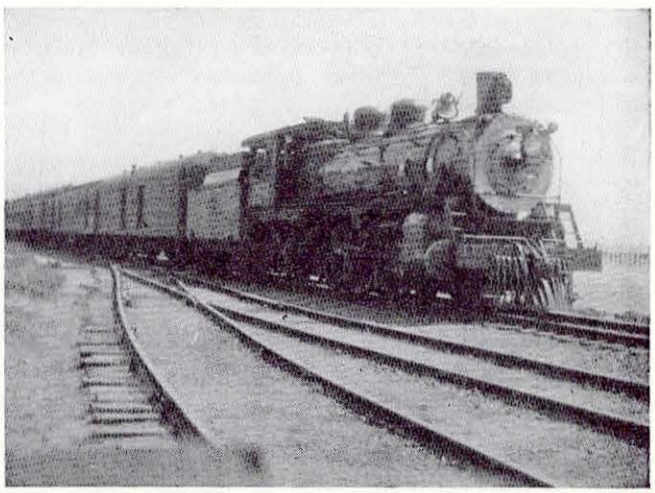
*April figures
Figures missing where not reported

Inventories Up $6,000,000

Book values of materials in stock are always a factor in purchasing. The totals on May 1 for the Class I railroads, excluding switching and terminal companies, amounted to $299,528,000, as compared with $279,926,000 on January 1, and $305,780,000 on May 1, 1935. Based on reports from 85 railroads, fuel balances on May 1 were approximately $25,064,000, as compared with $22,818,000 on January 1, and $24,600,000 on May 1, 1935. Stocks of rails, which include used rail awaiting reapplication, totaled $36,741,000 as compared with $34,275,000 January 1, and approximately $37,500,000 May 1, 1935. Crosstie stocks totaled approximately $44,084,000, as compared with $42,020,000 on January 1, and approximately $54,000,000 on May 1, 1935. Storehouse and miscellaneous stocks totaled $185,971,000, as compared with $171,920,000 on January 1 and $182,200,000 on May 1, 1935. Book values of unsold scrap totaled $7,066,000, as compared with $9,427,000 on January 1, and $7,500,000 on May 1, 1935. With the exception of ties, stock balances show appreciable increases over January 1. The increase in stores stocks was $14,000,000.

These increases, in general, reflect materials accumulated for heavy programs of repair work which are being undertaken in all parts of the country, but they also point to the increasing difficulty of manufacturers in filling orders as rapidly as before in the face of the rapidly expanding buying in all directions.

* * *



On the Great Northern near White Rock, British Columbia

Railway Buying Captures Public Interest

Hundreds of articles in newspapers show educational value of the "news" about carriers' spending

AN analysis of the railroad news published in newspapers affords a remarkable demonstration of the wide interest which the public is taking in the railroads as buyers of equipment, materials and fuel, and an equally remarkable demonstration of the value of disseminating the facts about railroad purchases in educating the public concerning the importance of the railroads to business and employment.

By the simple expedient of adding up the circulation of newspapers known to have quoted the *Railway Age*, it is ascertained that in the last four and one-half years over 100,000,000 copies of daily newspapers carried articles about railway purchasing. This total counts but one edition of city papers and does not count unnumbered articles in national magazines, in literature distributed by railroads and banks, and statements made before commissions, radio or other audiences where the same or similar facts about railway purchasing have been announced, analyzed, interpreted or otherwise considered.

Public Understanding Improved

If most people in the United States know "only what they read in the newspapers," thousands, or better, millions of people, from the farmer to the lawmaker, know more about railroads than previously, judging from the amount of information which these barometers of popular interest have been spreading about railway buying since the depression began. People to whom railroads were nothing but "corporations that set fire to their fences and timber lands and ran down their hogs" have seen new light on the subject, and so have people, young and old, to whom railroads were nothing but "combinations that soaked shippers," and, in keeping with conventional notions, at last began to reap a "well-deserved destruction" from competition.

The newspapers have shown people in big cities and little towns that the railroads are important to business and employment as large consumers of the products of mines, forests and factories, and that their purchasing is vital to the heavy industries in which unemployment has been greatest. As it became apparent that the retail sales, automobile and beer barrel production, and the make-work PWA and other alphabetical enterprises of the federal and state governments were not enough to bring national consumption back to the high-water mark, the news about increasing railway purchases, flashed over the wires and printed on front pages and in editorial and financial sections of the press, has furnished a positive indicator of railroad success in staging a come-back, and has been a tonic to business in other ways.

11,000,000 See Rise in Buying

Some idea of the public interest in railway purchases which has been created and reflected by the daily press is obtained from the results of the latest broadcast—an analysis of purchases made by the railroads from manufacturers in the first four months of 1936. These figures as compiled and issued by *Railway Age*, were published in newspapers of May 21 and 22, having a combined circulation of more than 11,000,000. A few of the clippings from newspapers quoting these figures are shown in the accompanying illustration. The news was given a preferred place in the telegraphic dispatches of the day. It was given top-of-column headings and more than a half a column of space in many papers. Typical headlines which greeted the public were "Railroads List Huge Spending Program," "Railroad Spending Hits Five-Year High Mark," "Rails Spending Heavily in Four Months," "Huge Spending by Railroads," "Equipment Buying by Rail Systems Tops $230,000,000," "Biggest Rail Spending Year in Five Years," "Railroads Embark on Big Spending Spree," "Volume of Rail Orders Create 250,000 Jobs," etc.

More News This Year

In the last four and one-half years approximately 18 compilations, prepared by *Railway Age* on railway purchases with the co-operation of the railroads, have been quoted in the press. In 1932, one article was known to have been quoted in newspapers having a combined circulation of more than 2,000,000, another 3,000,000, and a third, over 12,000,000. In 1933, when spending by some roads approached the vanishing point and smokeless stacks and dark bank windows showed the seriousness of the unemployment situation, newspapers whose combined circulation exceeded 2,500,000, are known to have quoted one article, while another article, printed chiefly in small papers, scored over 4,000,000 circulation. In 1934 four articles totaled over 9,000,000 circulation. In 1935 seven articles scored 25,000,000 circulation; and already this year the circulation of papers known to have quoted and commented on railroad purchasing is about 25,000,000. While officers and employees of the railroads have been attending to their myriad tasks, the pluses and minuses of their material wants, taken from pigeon holes and dull records in railroad offices, have traveled far and wide, with pointed and challenging messages about an aspect of rail transportation which was little recognized before, even among railroad men.

New Dealers and Anti-New Dealers

Barring carloading figures and important government announcements affecting railroads and the occasional stories about the introduction and performance of new fast trains, an analysis of railroad news shows railway purchasing has been publicized in the press more widely than other railroad news. It has also enjoyed the distinction of being published alike by New Deal and anti-New Deal and by pro-railroad and anti-railroad papers. Few newspapers can be found in this country which have not had something to say about the decline and recovery of the vast purchasing power of the American railroads. The increasing space which is being given by the daily papers to all reports made available of recent expenditures and the increases in those expenditures indicate that this interest in railway buying will expand. The daily press has proved that railway purchasing is "news." The *Railway Age* takes pardonable pride in contributing to that wide dissemination of the facts which the daily press is equipped to give it.

RAILROADS LIST HUGE SPENDING PROGRAM
Railroad Spending Hits Five-Year High Mark
Railroads Aiding Recovery Trend by Heavy Spending
RAILWAY SPENDING PROGRAM BIGGEST EVER, IT IS SAID
RAIL SPENDING AT 5-YEAR TOP AS TRADE RISES
CHICAGO, ILL. HERALD-EXAMINER HAILS IN BUYING MOOD; ORDERS BEST SINCE '31
Railroad Spending Best In U. S. in Last 5 Years
RAIL SPENDING IS DOUBLE 1935
Railroads Buying Much New Equipment
RAILROAD SPENDING BOOMS
RAILS SPEND HEAVILY IN 4-MONTH PERIOD
EQUIPMENT ORDERS BY RAIL SYSTEMS TOP $230,000,000
Big Railroad Spending Totals $230,000,000
Expenditures For First Four Months Of 1936 Nearly Double Those Of Same Period Of 1935; Most For New Equipment
Rail Spending Program Seen At 5-Year Peak
RAILROADS EMBARKED ON BIG SPENDING SPREE
230 Million Spent By R. R. In Four Months
HUGE RAILROAD ORDERS PLACED
DISTRICT SHARES BUSINESS PLACED
Railway Spending Last Four Months Largest Since '31
HUGE QUARTER'S SPENDING SEEN BY RAILROADS
Railways Spend $230,000,000 In Four Months
Rail Spending Program Sets New High Mark
230 Million Dollars Spent Thus Far in 1936 for Materials
Railroads Spend Most Since 1931; Business Mounts
250,000 New Jobs in Rebuilding Program, is Estimate
RAILROADS START SPENDING SPREE
RAIL SPENDING IS HIGHEST SINCE '35
ThreeRailsBuy $15,000,000 of Equipment
Rail Spends 230 Million For Expansion in 3 Months
RAIL PROGRAM TO GIVE JOBS
250,000 to Be Put to Work by $230,000,000 Expenditures For Improvements
HUGE SPENDING BY RAILROADS
Rail Spending Pours Forth New Millions
Expenditures Reach Highest in Five Years, Magazine Reveals
RAIL RENOVATION AT 6-YEAR HIGH
Most of Spending Made Necessary to Handle Increase in Business.
ROADS SPENDING HUGE SUMS FOR NEW EQUIPMENT
230 MILLIONS SPENT BY RAILROADS IN '36
RAILS SPEND $230,000,000 IN FOUR MONTHS
RAIL ORDERS BEST SINCE '31
FINANCE NEWS TOLD IN BRIEFS
Car Loadings Advance Sharply; Other Corporation Notes
RAIL SPENDING AT HIGH LEVEL
Railroad Spending Program Hits New High
$230,000,000 Laid Out In Four Months
Railway Spending Highest in Years
HUGE RAIL SPENDING Program Announced
RAILROAD SPENDING FIVE YEAR RECORD
Volume of Rail Orders to Create 250,000 Jobs
Huge Railway Spending Noted
RailSpending Plans Highest In Five Years
RAIL SPENDING HITS NEW FIVE-YEAR HIGH
BIGGEST RAIL SPENDING ERA IN 5 YEARS
Rail Spending Pours Forth New Millions
Rails Expend Vast Amounts
Rail Spending in 4 Months Is Best Since '31
Big Increase In Spending By Railroads
Volume of Rail Orders to Create 250,000 Jobs
SPENDING PROGRAM OF RAILROADS FIRST 4 MONTHS OF 36 BIGGEST IN FIVE YEARS
Expenditures During That Period Is Almost Twice First Third of '35
Most of the Spending to Meet Demands Made by Increased Business
Railroad Spending Hits Five-Year High Mark
Railroads Spending Twice as Much as Same 1935 Period

Over 11,000,000 People Saw This Article

Partial Reproduction of Clippings from a Few of the Newspapers that Quoted a Summary of Railway Purchases for the First Four Months of 1936 Compiled by the *Railway Age* from Figures Furnished by the Railroads and Published in the Daily Papers on May 22.

Co-ordinator's Report on Dining Car Supplies Aired

Incomplete study claims overhead can be cut over $100,000 a year by increasing turnover of stocks

BY further simplifying the supplies purchased by the railroads for use in their restaurants and dining cars, by establishing uniform accounting of the expenses of ordering, purchasing and distribution, and by organizing the work more effectively, the railroads can eliminate a million dollars from their inventories of commissary supplies and save more than $100,000 a year in carrying charges, according to a report of studies submitted as information to the Association of American Railroads by the Federal Co-ordinator before that office was closed on June 16.

The studies, which the Co-ordinator explained were preliminary only, were based on the analysis of figures for the year 1934, obtained from 46 railroads by the Purchases and Stores division, A.A.R., and on some additional statistics and information which the Co-ordinator's office obtained directly from five railroads which have turned their commissary work over to the stores department.

Turnover Varies Widely

The 46 roads were shown to have had a total stock balance of commissary supplies on December 31, 1934, of $2,368,305, and average monthly disbursements to closed accounts during 1934 of $1,039,233. Twenty-four of the roads were operating on less than a 45 days' stock of commissary supplies, while 22 roads were operating on a stock exceeding a 45 days' supply. The stocks of different roads varied from a minimum of 4 days' supply to a maximum of 290 days'.

The report states that "an examination discloses no essential differences between the characteristics of the roads composing each group. It is therefore reasonable to assume that a 45 days' supply is a reasonable maximum. If the 24 roads with stocks exceeding a 45 days' supply should reduce such stocks to this reasonable maximum, a reduction of $991,247 would occur. The average annual charge for carrying this excess stock amounts to 11 per cent. The elimination of this charge would mean an annual saving of $110,028. This figure would be increased if the roads should reduce stocks below the 45-day maximum. It is reasonable to assume that this can be done, as many roads have already done it."

Supervision of Ordering and Disbursing

Of 43 roads reporting, it was brought out, the ordering, receiving and disbursing of commissary supplies is in charge of the dining car department in 37 instances, and the purchasing department in one instance, while the stores departments now handle the work on the Canadian National; the Chicago, Burlington & Quincy; the Delaware, Lackawanna & Western; the Illinois Central; and the Missouri Pacific. Figures from the D. L. & W. were unsuited to the study because they included certain restaurant data, but statistics of the other roads were given in the report to show the stock balances, disbursements, rates of turnover and expenses for the three years prior to stores control and a like period since stores control.

Four Roads Organize

The report continued in part: "Stocks were reduced 28.69 per cent, from $524,550 to $374,041, or $150,509. The annual saving (interest on investment, obsolescence, taxes, insurance, interest on investment in stores facilities, deterioration, depreciation and wastage) on this reduction was $16,706. Although annual expenses increased after stores control on two roads, the net annual saving in expenses for all four roads was $18,595. Every road showed a net total annual saving. The net total annual saving for all four roads was $35,302. It is understood that all roads reporting expect to effect further reductions in stock, increase rates of turnover and cut present expenses.

"One road has saved money by placing all laundry

Table I—Stocks of Dining Car and Restaurant Material and Supplies December 31, 1934[1]

	On hand	Average monthly disbursements	Days' supply on hand	Possible reduction based on 45 days' supply
Grand Total	$2,368,305	$1,039,233	...	$991,247
Total—Over 45 days' supply.	1,909,162	611,675	...	991,247
L. V.	73,946	7,638	290	62,489
F. E. C.	8,565	1,145	224	6,847
G. M. & N.	460	69	200	356
C. M. St. P. & P.	136,239	20,801	196	105,037
N. Y. C.	548,746	99,713	165	399,176
S. D. & A. E.	1,148	222	155	815
L. & N.	29,477	7,905	112	17,619
U. P.	192,637	55,237	105	109,781
T. & N. O.	22,918	6,992	98	12,429
C. R. I. & P.	106,865	34,682	92	54,437
D. & H.	5,732	1,875	92	2,919
I. C.	74,057	25,041	89	36,495
C. B. & Q.	77,024	27,663	84	35,529
C. & E. I.	8,280	3,320	75	3,299
N. C. & St. L.	9,485	3,885	73	3,657
N. P.	102,614	43,386	71	37,535
S. P. & S.	3,355	1,422	71	1,222
B. & O.	150,650	64,120	69	54,470
C. & O.	21,797	10,022	65	6,764
M-K-T	34,970	19,465	54	5,772
N. & W.	21,327	12,007	53	3,316
S. P.—Pac. Syst.	192,637	110,267	51	27,236
Reading	5,905	3,780	48	235
G. N.	80,328	51,018	47	3,801
Total—Under 46 days' supply	459,143	427,558	...	.....
M. St. P. & S. St. M.	7,331	4,802	45	.....
G. T. W.	3,323	2,206	45	.....
Erie	10,911	7,901	42	.....
C. St. P. M. & O.	7,320	5,294	42	.....
Penna.	175,094	130,116	41	.....
D. L. & W.	12,562	9,162	41	.....
S. A. L.	27,591	22,674	37	.....
C. I. & L.	6,724	5,508	37	.....
B. & M.	10,286	8,639	36	.....
A. C. L.	21,150	18,179	35	.....
N. Y., N. H. & H.	94,567	79,423	33	.....
C. & N. W.	27,894	25,898	32	.....
T. & P.	10,284	10,908	29	.....
N. Y. C. & St. L.	935	976	29	.....
A. B. & C.	8,275	9,959	25	.....
P. M.	2,255	3,188	21	.....
C. G. W.	916	1,294	21	.....
C. of N. J.	5,706	10,596	16	.....
C. of Ga.	319	653	15	.....
Mo. Pac.	22,414	51,083	13	.....
Wich. Val.	407	945	13	.....
St. L.-S. F.	2,879	18,154	4	.....

[1] Latest report of Division VI, Purchases and Stores, Association of American Railroads, based on previous twelve months' disbursements.

work on a bid and contract basis instead of giving the work to one company without any competitive bidding, as was the former practice. Secondhand dining car and commissary equipment valued at thousands of dollars has been gathered from all parts of the system and after inspection, cleaning, renovating, etc., is being reissued for use. Previously, it was very difficult to get anyone to use secondhand material, regardless of its condition. Items of stock are being simplified and standardized wherever practicable.

"Another road has closed one commissary store and consolidated the stock with that of another store. This has resulted in both a substantial stock reduction and a saving in payroll, even though there has been an increase in its dining car business. Better organization of work added still more savings. Another road, in addition to reducing stocks and expenses, has experienced less trouble with shortages and inventory adjustments since stores control. Still another road reduced its investment in stock, provided better storage facilities, including cold storage plants of adequate capacity to permit quantity purchase of fruits, vegetables and produce at opportune times, and installed a better method of accounting for stocks."

Although five railroads have produced economies by transferring to their stores departments control of dining car and restaurant material and supplies, the report concluded that there is no reason to believe that the departments previously in charge could not have produced like results. Many railroads vest control with other departments and these other departments have kept stocks under a 46-day supply.

Would Standardize Accounting

The report contended that present methods of accounting for stock balances and expenses should be made uniform. Any railroads, it stated, that may be carrying in their material and supplies account items which are in actual service, such as silverware, linens and glassware, should conform to the Interstate Commerce Commission instructions which require that such material be charged to operating accounts. Uniformity in accounting for the return to stock of secondhand material and equipment is also highly desirable.

While some progress has been made in the simplification and standardization of dining car and restaurant material and supplies, the report continued, the surface has scarcely been scratched. It is granted that there are certain limitations to material simplification and standardization of some of these materials, due to desired retention of the sales and esthetic value. Each railroad can, however, study its own conditions and go a long way in simplifying its requirements without sacrificing individuality.

It was recommended that the vice-president of the operation and maintenance and the vice-president of the finance, accounting, taxation and valuation departments of the Association of American Railroads appoint a joint committee on the subject, empowered to gather necessary information and required to submit progress reports and a final report within a specified time. The report is now awaiting study by the railroads.

Table II—Commissary Supplies Before and After Control by Stores Departments

	Average annual stock on hand	Disbursements to closed accounts	Expenses	Number of turnovers For period	Number of turnovers Annual average	Expenses for period Per cent	Expenses for period Per $1000
Canadian National:							
Before (1928-1930 inc.)	$247,333	$1,420,497	$262,244	5.74	1.91	18.46	184.61
During (1931-1933 inc.)	190,046	920,074	179,922	4.84	1.61	19.56	195.57
Chicago, Burlington & Quincy:							
Before (6/1/32-6/1/35)	87,368	782,782	114,146	8.96	2.99	14.58	145.82
During (6/1/35-6/1/36[1])	66,145	346,321	28,996	5.24	5.24	8.37	83.73
Illinois Central:							
Before (1922-1924 inc.)	84,989	2,081,326	123,206	8.16	2.72	5.92	59.21
During (1926-1928 inc.)	70,633	2,527,003	140,588	11.93	3.98	5.56	55.63
Missouri Pacific Lines:							
Before (1925-1927 inc.)	104,858	4,355,334	49,499	41.54	13.85	1.14	11.37
During (1928-1930 inc.)	47,216	4,021,683	54,402	85.18	28.39	1.35	13.52

[1] Last six months' business estimated and based on a comparable previous three-year period.

A.A.R. to Continue Co-ordination Studies

WASHINGTON, D. C.

THE railroads, under the leadership of the Association of American Railroads, will continue the studies of railroad operations which were carried on by the federal co-ordinator of transportation and the regional co-ordinating committees of railroad executives under the emergency transportation act, which expired on June 17, and will effect co-ordination of facilities and services where practicable, according to an announcement by J. J. Pelley, president of the association.

Studies of economies through co-ordination had been begun by railroad committees in the Eastern, Western and Southern regions prior to the enactment of the co-ordinator law. After the passage of that act in 1933, Co-ordinator Eastman continued these studies through the regional co-ordinating committees of railroad executives set up under the law and also inaugurated a series of studies covering the general field of railroad operation.

Feeling that further pursuit of all these studies is of importance, the board of directors of the Association of American Railroads has requested the railroads in each of the three regions to select an appropriate committee to take up promptly and carry on the study of projects already under consideration, and such other projects as may be presented. These committees are to report to President Pelley, who is also directed to take up with the individual railroads the matter of accomplishing the economies which may be indicated.

In addition to the co-ordination projects considered by the regional committees, the association will continue the study of the various reports of the federal co-ordinator as to possible economies in general railroad operation,

with the purpose of putting into effect those which may be practicably attained.

The resolution adopted by the board of directors follows:

WHEREAS, Title I of the Emergency Transportation Act, 1933, ceased to be effective on June 17, 1936, and thereby the Federal Co-ordinator of Transportation and the Regional Co-ordinating Committees ceased to exist, and

WHEREAS, during the period in which this Title was in effect extensive and important investigations affecting all forms of railroad transportation were carried on by the Co-ordinator, and Co-ordinating Committees involving, first, studies affecting all the railroads as to methods of operation and, secondly, studies for the more economical operation of the railroads through co-ordination of facilities and services:

BE IT RESOLVED:

1. That the Association of American Railroads hereby assumes, so far as permissible under the law, the obligation of carrying forward the duties heretofore imposed on the Federal Co-ordinator of Transportation in respect to the continuance of these studies and the affecting, where practicable, of economies in operation by co-ordination of services and facilities;

2. That the Association of American Railroads requests the member roads, through the three regional executive organizations, promptly to select an appropriate committee for each of the three regions, said committees to take up the study, under present conditions, of the projects heretofore considered by the three Regional Co-ordinating Committees and such other projects as may from time to time be presented whereby economies in operation may be effected by co-ordination of services or facilities;

3. That said committees shall be under the direct jurisdiction of and report to the president of this association from time to time in such manner and in such detail as he may require.

4. That the president of the association be directed to pursue these studies with the individual railroads involved to the end that the economies indicated as possible may be accomplished.

5. That the president of the association be directed to have the several reports of general nature as to the railroad industry further studied and make report to this board the result of such studies and the ends that may be practicably attained thereunder.

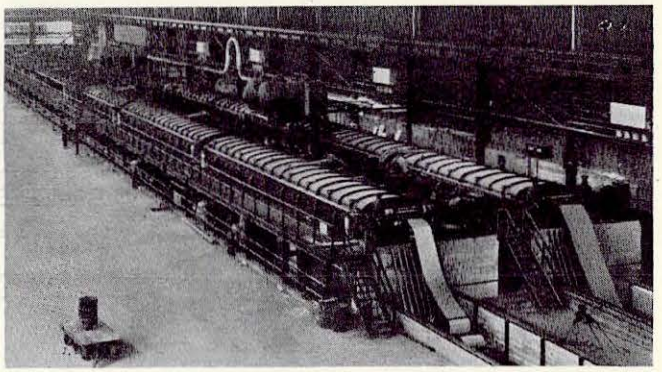
Bethlehem Opens Continuous Strip Mill

A NEW continuous strip mill with an annual capacity of 600,000 gross tons of steel sheets or thin plates was formally opened by the Bethlehem Steel Company at Lackawanna, N. Y., on June 30. The product of this plant, which is available in various grades of material from hot-rolled, self-annealed sheets to annealed cold-rolled sheets of any quality or finish desired, may be had in dimensions ranging from a width of 18 in. and a minimum thickness of 0.05 in. to a width of 60 in. and a maximum thickness of 0.0625 in., in a width of 72 in. and a maximum thickness of 0.078 in. The continuous strip process affords better control of quality and effects a material reduction in the cost of production, compared with the single-mill process that entails the arduous manual handling of the metal through the successive passes.

The plant at Lackawanna embraces facilities to accommodate all phases of the process, including storage, heating, rolling, shearing, slitting, pickling, annealing and normalizing. Space is available for the storage of 10,000 tons of slabs to insure uninterrupted operation of three gas-fired heating furnaces with a capacity of 165 tons of slabs per hour.

The hot strip mill embraces a train of three roughing stands and a train of six finishing stands, each train embracing a scale breaker provided with water jets at 1,000-lb. pressure to wash off the loosened scale. The movement through these nine mills and two scale breakers is continuous, except that the slabs are held on a roller table between the roughing and finishing trains until the temperature has been reduced to 1,900 to 1,950 deg. F.

With the reduction in thickness at each succeeding

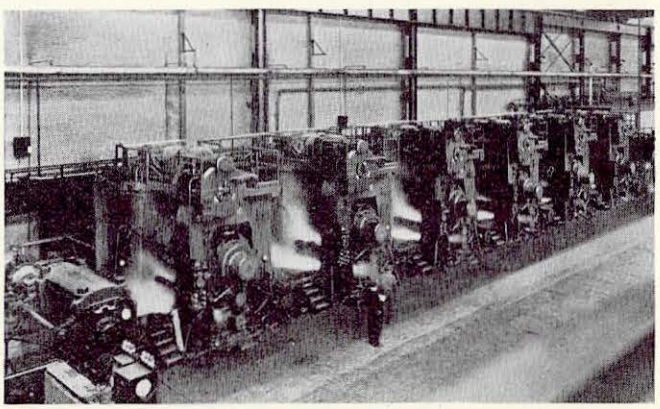


Where One Coil of Strip Steel After Another Moves Through the Continuous Pickling Process

pass, there is a corresponding increase in length (in both the roughing and finishing trains). Consequently an essential element of the continuous process is a progressive speeding up of each succeeding set of rolls to avoid the buckling or looping of the strip between mills. This is done by means of an electrical control system that is so accurate as to avoid either buckling or pulling. Because of this speeding up the strip leaves the last finishing roll at a speed of as much as 1,352 ft. per min., depending on the amount of reduction in thickness.

After leaving the last finishing stand the strip is either cut to the desired sheet lengths by a "flying shear" synchronized to the speed of the strip, or it is wound up like a ribbon in a coiling machine. The sheared sheets are mechanically stacked for self-annealing or are pickled and normalized, depending on the requirements of the product.

The coiling is done primarily to facilitate further



The Six Roll Stands of the Finishing Train in the Hot Mill—Scale Breakers on the Left

processing in the cold strip mill, which embraces such operations as pickling (for which purpose the strips are stitched end to end for continuous handling through the vats), cold rolling through three stands of tandem mills, box annealing and skin-pass rolling. All phases of the operation are under laboratory control to insure an effective check of the quality of the product.

Further Progress in Study of Rails*

Continuation of investigation, sponsored by the railroads and the rail manufacturers, develops further data that confirm conclusions reported a year ago

By H. F. Moore

Research Professor of Engineering Materials, University of Illinois, in Charge of the Investigation

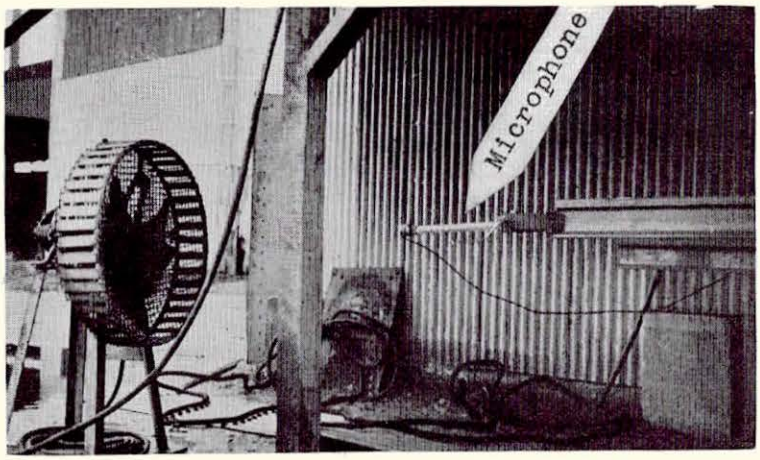


Fig. 1—Microphone Test for Cracking of Rails While Cooling at Plant of Tennessee Coal, Iron & Railroad Company

THE problem of studying fissures in rails may be divided into two general divisions. The first division of the work seeks to answer the question: "What will the materials stand?", and that is found mainly in laboratory tests. The second division seeks to answer the question: "How much does the structure or the structural part have to stand in service?", and that, in general, is answered by field tests and statistical information.

The first report of this investigation† had to do mainly with the first question: "What will the material stand?", and it may be summarized as follows:

The genesis of an internal fissure, transverse or otherwise, in a rail is nearly always, if not always, a shatter crack, in the center of the head of a rail. However, it must always be borne in mind that nowhere nearly all shatter cracks develop into fissures. A shatter-cracked rail is not devoid of strength altogether; however, it has its strength weakened, sometimes by as much as 50 per cent. The theoretical shearing stress at the shatter-crack zone, due to wheel load, the strength of cracked rail-steel specimens in fatigue tests, and the wheel load found necessary to develop fissures in shatter-cracked rail specimens tested in a repeated-rolling load testing machine—all these fit into a consistent picture of the mechanism of the development of internal fissures in rails.

The search for the cause of shatter cracks is a very complicated problem in mill practice. It is not at all certain that any *one* cause explains all shatter cracks. During the investigation it seemed at first that an index to at least one important cause of shatter cracks might be found in the silicon content of rail steel. The data checked very nicely along this line until rails from one mill were found to be high in silica and yet unusually free from shatter cracks. The problem of determining the cause of shatter cracks seems to be a complicated problem of mill practice, and so far the clear determination of *all* the causes of shatter cracks has escaped detection.

However, a field for a study of the *prevention* of cracks by treatment during the cooling process was suggested by processes already applied commercially by some of the Canadian steel mills and processes in use experimentally in this country. As previously reported, a rather extensive study was made of methods of thermal treatment during the cooling of rails, and so far the laboratory study of preventive thermal treatment has checked results reported in practice. Laboratory tests of rails which had been control-cooled at the mills disclosed no shatter cracks. No internal fissures have so far been developed in the Materials Testing Laboratory of the University of Illinois in any thermally treated test rail—either a control-cooled or a normalized rail. Of course, things occasionally happen in practice that laboratories have been unable to reproduce. But certainly there is evidence that the elimination of shatter cracks and, consequently, the probable immunity against the production of internal fissures seem to be very greatly helped by proper thermal treatment during cooling.

Test for Cracking of Rails While Cooling

Among the projects undertaken since the preparation of the first report was a mill study made in an effort to determine the range of temperature during which cracking occurred. The method of attack adopted was the use of a microphone attached to a cooling rail, suggested by F. M. Graham, assistant engineer of standards of the Pennsylvania, and tried in a very simple way in certain English rolling mills, and by the Lackawanna Steel Company.

Figure 1 shows a new 39-ft. rail, placed outdoors under slightly more severe conditions of cooling than those on the hotbed. A microphone attachment is clamped to the end of the rail, and the fan shown in the picture was used in certain cases to throw a blast of air on the rail.

Amplifying tubes were used to amplify the current from the microphone, caused by slight sounds, to recorders and to the output meters used for checking the performance of the amplifier, the records being made on a moving tape by means of a pencil. Readings of rail temperature were taken at regular intervals.

It was not thought that this microphone test would serve as a non-destructive test for shatter cracks in rails as it would be a rather slow and complicated test.

* Abstract of Second Progress Report of Investigation of Fissures in Railroad Rails, published in Bulletin 386 of the American Railway Engineering Association.

† *Railway Age* for August 31, 1935, page 269.

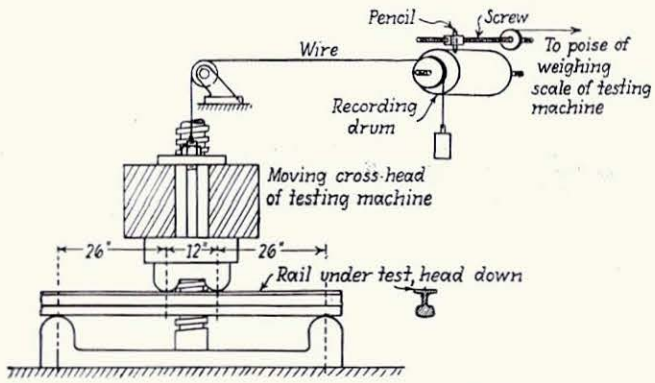


Fig. 2—Diagram of Test Rig for Bending Tests of Rails

It was hoped, however, that it might be used to determine the range of temperatures during which the cracking occurred. However, it was found that in spite of attempts to filter out the sounds from the mill and noises of the rails grating over the supports, so many sounds were recorded which obviously were not cracks that we could not tell very much by this test. A second test involving parallel observations on a cold or "dummy" rail has been made but the data have not yet been reduced.

Acceptance Tests for Rails

To the test party no question has appeared more important in this rail investigation than the question of proper tests for detecting a shatter cracked condition in a rail. Such tests may be divided into destructive tests of samples and non-destructive tests of rails. Destructive tests of samples include the drop tests (head-up and head-down), the bend test (head-down), and the etch test. The advantage of the destructive tests is that they give positive, easily recognized results, and are not prohibitively expensive. The disadvantage of all destructive tests is that they are tests of *samples*, and it is never possible to be sure that samples are thoroughly representative. That is especially troublesome with the detection of shatter cracks in rails. Shatter cracks have been found in some rails of a heat and not in others of the same heat. They have been found in parts of a rail and not in other parts of the same rail. However, it should be remembered that destructive tests of samples, while not perfect, are, if carefully performed, far better than no tests at all.

Experience in the testing of many rails has led to the following conclusions regarding the bend test and the drop test: As a detector of shatter-cracked rails the common head-up drop test is practically useless. Many shatter-cracked rails will pass this test without any trouble. The drop test head-down is somewhat better, but many shatter-cracked rails will withstand one blow

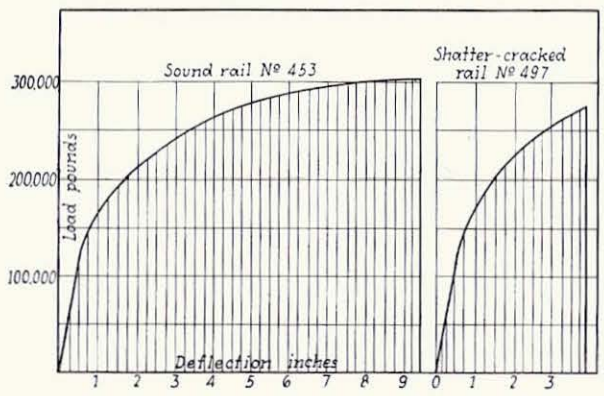


Fig. 3—Load-Deflection Curves—Bending Tests on Rails

head-down. The repeated drop test, counting the number of blows, is probably still better, but has two serious disadvantages. In the first place, the blows are delivered to the rail in increments of about 40,000 ft. lb. of energy. It is impossible to distinguish between a rail which withstands a little above 100,000 lb. and one which withstands a little below 120,000, and that means the test is not at all sensitive.

The second and still more serious objection to the repeated drop test is that after the first blow the rail is distorted, bent and twisted—and succeeding blows do not strike the rail in the same way—do not stress just the same parts; this is especially noticeable in a head-down drop test.

Figure 2 is a diagram of a bend test with the head down and with the load applied at two points symmetrical about the center of the span, giving a space of about six inches where the rail is under uniform bending moment and stress. The load on the rail is recorded on a drum attached to the weighing beam of the testing machine. The deflection is recorded by the revolutions of the drum, and the result of the test is a load-deflection diagram, as shown in Fig. 3. The deflections are large,

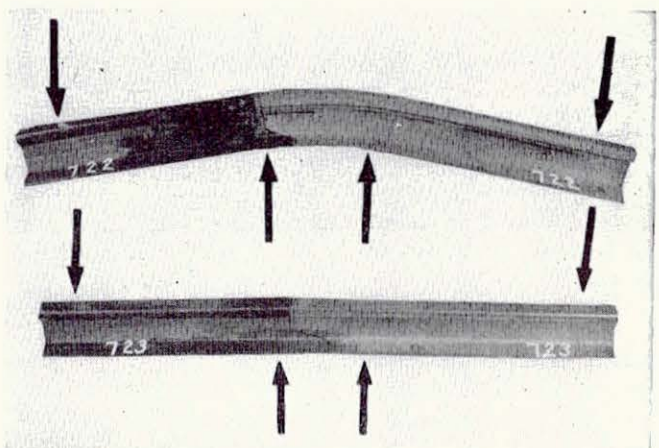


Fig. 4—Rails After Bend Test. Upper Rail Showed Shatter Cracks in the Etch Test. Lower Rail Showed No Shatter Cracks in the Etch Test

sometimes as high as eight or nine inches. The area under a load-deflection diagram is measured, and is a measure of the energy required to fracture the rail. In the bend test the energy applied is under very good control, and the whole test is much more sentitive, quantitatively, than the repeated drop test.

Figure 3 shows typical records for a rail without shatter cracks (as shown by the etch test) and for one with shatter cracks. This test has not rated 100 per cent as a detector of shatter-cracked rails, but it has given better results than any of the other tests we have tried.

Figure 4 shows typical fractures under the bend test. The lower rail was a sound rail, free from shatter-cracks, and the upper one a shatter-cracked rail. Of course, the question at once arises: "What is the effect of speed of loading?" At speeds which are developed in the drop test and others, the speed effect does not seem to be very great. It usually takes more energy to break a rail suddenly than with a slowly applied load, but with a series of rails, the relative values would probably be approximately the same whether the drop or the bend test were used. The bend test seems to show under better controlled conditions the same sort of thing that the drop test does, and in addition gives load values.

Metallographic work has embraced many hundred etch

tests and metallographic examinations. The cost of the etch test is not prohibitive, although cutting the rail head into several slices costs a good deal in hack-saw blades. The etch test is not a quantitative test. Application of the etch test as an acceptance test would probably involve questions of tolerance of longitudinal shatter-cracks, and of shatter-cracks deep in the rail. Longitudinal shatter-craks are in all probability less disastrous than are shatter-cracks near the surface.

It is the present opinion of the test party that if we had to choose a test today which would be of value in detecting shatter-cracked rails, we should recommend the head-down bend test with auxiliary etch tests in case of any doubt. The bend test would require a 500,000-lb. testing machine powered for high speed tests.

Of course, the ideal test for shatter cracks would be a non-destructive test applied to every rail. While no such test has been discovered which is sufficiently sensitive to detect shatter cracks in a newly-rolled rail, a non-destructive test would be so useful and so important that it is felt that further research is worth while. The

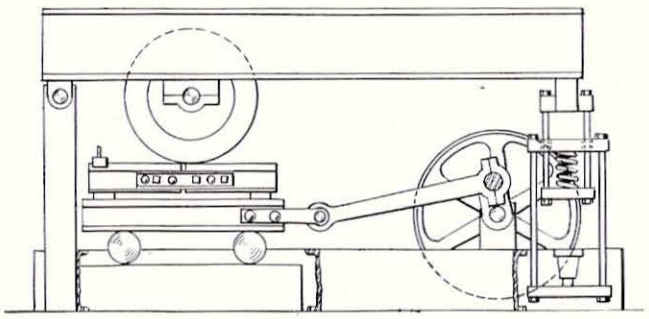


Fig. 5—Arrangement of Rolling-Load Machine for Batter Tests

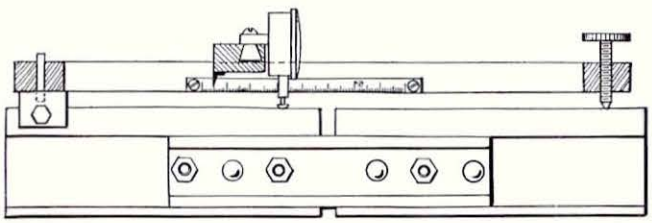


Fig. 6—Micrometer for Measuring Batter of Rail-Joint Specimen

quantity of metal around the shatter-crack or adjacent area which may become cracked is very minute, compared with the volume of the rail, probably a fraction of one per cent. A reliable non-destructive test must show positively rather small variations in this one-tenth of one per cent of volume. However, recent tests have been proposed and tried abroad, using a form of extremely high frequency waves, "super-sonic" waves, as they are called.

Metallographic and Chemical Studies

Mention has been made of metallographic and chemical tests. These have involved a large amount of routine work, but so far no outstanding features of either chemical composition or metallographic structure have been associated clearly and definitely with shatter cracks. Some studies have been made, mainly from current metallurgical literature, of gases in steel. It seems that the gases which *remain* in rail after it is cooled are not of any great importance, but the gases which may cause trouble are those which escape—or attempt to escape from the rail while cooling takes place. A similar condition holds for residual stresses. The stresses which have been measured in rail after it has been cooled are

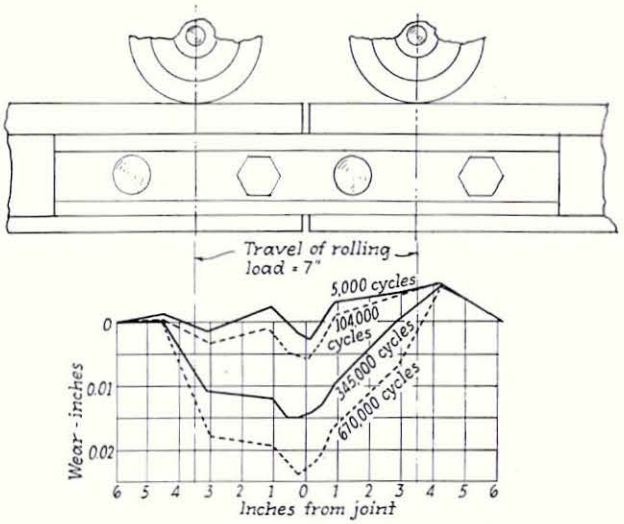


Fig. 7—Rolling Load "Batter" Test of 130-Lb. Rails. Maximum Movement 350,000 in. Lb. With 75,000-Lb. Wheel Load

appreciable, but not enough to explain cracking, and in most cases have been of the wrong sign to start cracking in the center of the head. However, those stresses have no relation which we can discover with the very much higher stresses which may exist, especially over localized areas, while the rail is cooling. Obviously it would be a very difficult problem to measure the stresses while the rail is cooling.

Tests of Rail Batter at Joints

Figure 5 shows the arrangement of a rolling-load machine for a batter test on a rail joint. The specimen, T, is supported with a rail joint at mid-span, and at the left end of T is a clamp, C, with a little dowel pin D on it. To that dowel can be attached a micrometer measuring device, shown in Fig. 6 for taking "soundings" over the worn surface of the rails. The micrometer M can be moved longitudinally and crosswise. Contour lines of the surface of the rail heads can be plotted for any number of passages of a given load. Preliminary tests of batter are in progress and Fig. 7 shows one test result.

Field Tests for Wheel Loads in Service

What wheel loads do the rails have to withstand in service? Figure 8 shows the results of field tests for

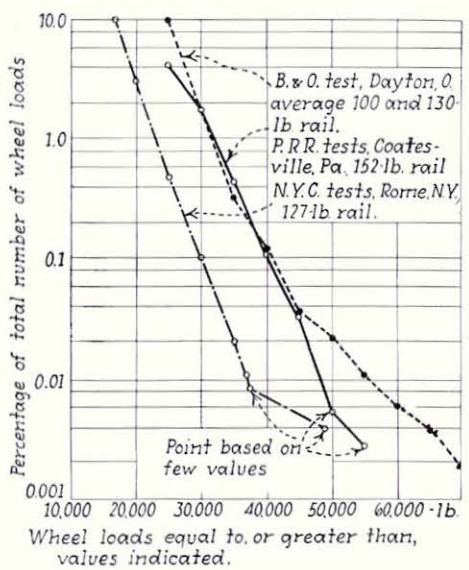

10.0
1.0
0.1
0.01
0.001
Percentage of total number of wheel loads
B. & O. test, Dayton, O. average 100 and 130 lb rail.
P.R.R. tests, Coatesville, Pa., 152 lb. rail
N.Y.C. tests, Rome, N.Y. 127 lb rail.
Point based on few values
10,000 20,000 30,000 40,000 50,000 60,000 lb.
Wheel loads equal to, or greater than, values indicated.

Fig. 8—Load-Frequency Diagrams for Field Tests at Three Locations

wheel loads. This graph shows the same data as were shown in previous report (tests on the Baltimore & Ohio north of Dayton, Ohio, and on the Pennsylvania near Coatesville, Pa.). In addition, results are shown for tests on the New York Central east of Rome, N. Y. On the Baltimore & Ohio and the Pennsylvania the track was subjected to heavy ore and coal traffic. On the New York Central the traffic was mixed freight with a large proportion of refrigerator cars, and a comparatively

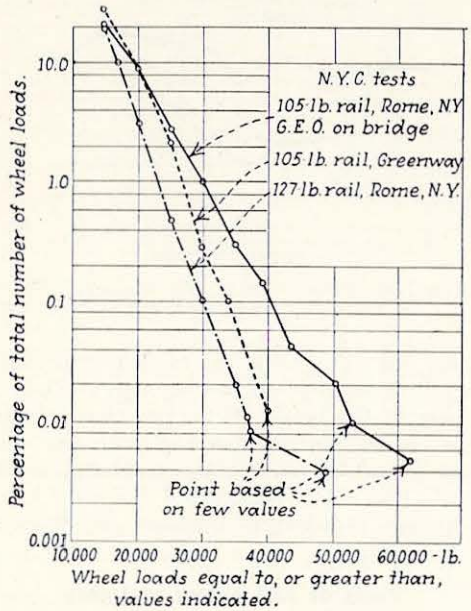


Fig. 9—Load-Frequency Diagrams for Field Tests of Sections of Track With Different Stiffness

small number of heavily loaded coal cars. The diagrams shown in Fig. 8 are based on about 36,000 wheel loads at Coatesville, 53,000 wheel loads at Dayton, and 25,000 wheel loads at Rome. At the New York Central location the frequency of high wheel loads is obviously less than on the other two locations—one 30,000-lb. wheel load per thousand passing wheels as against one 40,000-lb. wheel load per thousand passing wheels for the other two locations.

In interpreting the diagrams shown in Fig. 8 it should be remembered that the values shown are the average values for some ten instruments at a location. Now the

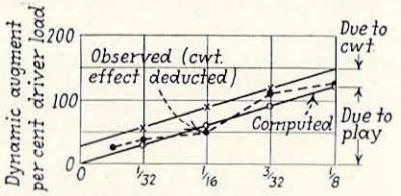


Fig. 10—Computed and Observed Values of Dynamic Augment of Driver Load Due to Play Between Rail and Tie

Computations Based on Following:
Driver Load 32,500 lb.
Unsprung Weight 8,500 lb.
Track Modulus 3,000 p.s.i.
Speed, 79 miles per hour
Length "Depression" approx. 54 in.
Unbalanced Mass "Down"

frequencies of high wheel loads at some *one* of these instruments might be several times the average frequency for the whole location. Consequently the development of a transverse fissure might occur sooner than the average results would indicate.

A series of tests was run at the location on the New York Central near Rome that produced some interesting results, as seen in Fig. 9. The graph furthest to the left is the one shown in Fig. 8. The center graph shows results on a 105-lb. rail, at Greenway, N. Y., where the track was less well maintained than the track with 127-lb. rail near Rome. The graph at the right shows results on a short length of 105-lb. rail on a bridge east of Rome. This location was picked out as a sample of stiff track. It will be noted that at both Greenway and Rome the frequency of high loads is less than at Dayton and Coatesville (Fig. 8), and also less than on the bridge. This does not justify the conclusion that transverse fissures are more likely to occur on bridge tracks than on ballasted track. The rate of *development* of transverse fissures is largely dependent upon the *bending* stresses, so that even if more transverse fissures were *started* on the stiff bridge track, probably they would not *develop* as fast as on ballasted track on account of the low bending stress. Furthermore, this is just one bridge, and it would be quite unwise to draw any general conclusion. Results on a bridge with ballasted deck might be quite different. This bridge location was selected merely as an example of stiff track.

Figure 10 is a study of the increase of wheel load (dynamic augment) resulting from the overbalance of a driver, as compared with the increase in load accompanying play between rail and tie. It will be noted that, for any given speed, as the amount of play in the rail support increases, the dynamic augment due to this play may become greater than that due to overbalance.

Looking over the data on wheel loads obtained so far it seems that in the speed ranges of trains below 25 m.p.h., flat spots on wheels are very prominent as a cause of high wheel loads. In the range of 40 to 50 m.p.h., hard spots in the track seem prominent, and in the range of 60 m.p.h. and above, out-of-round wheels, overbalance and abnormally high track play seem to loom up as important factors.

The plans for field tests during this year include testing on a typical location on a western railroad with a traffic condition and structure typical of western roads. Arrangements have been made to carry on field tests on the section of track laid with 110-lb. test rails on the Atchison, Topeka & Santa Fe near Matfield Green, Kan.

Maintenance of Track and Rolling Stock

Laboratory tests indicate that repeated wheel loads of 40,000 lb., or over may spread shatter cracks to surface fissures. Loads of that magnitude certainly occur occasionally in ordinary service on well maintained track. Suppose that the improved methods of rail manufacture prove 100 per cent perfect. During the next 10 years there will still be hundreds or thousands of shatter-cracked rails in existing railroad track. For the immediate future the reduction of fissures, no matter how much the product of rail mills may be improved, will demand a high degree of co-operative work between track maintenance engineers and rolling stock maintenance engineers. Improved maintenance could not be expected to eliminate fissures, but it could be expected to reduce the number which occur per year.

THE NEW YORK, WESTCHESTER & BOSTON, subsidiary of the New York, New Haven & Hartford, announces that, beginning with July 1, commutation tickets between the New York terminus and all points on the road outside of New York City will be advanced about 20 per cent, the necessary notice having been filed with the Public Service Commission. To Mount Vernon, 10 miles, the monthly rate is $6.60, as compared with $5.50 heretofore; 14-trip tickets $1.65, advanced from $1.55. Rates to and from other stations are in proportion; Port Chester, 21 miles, monthly $10.25; fourteen-trip, $2.45. The road is now in the hands of Clinton L. Bardo, as trustee.

C. and D. Hearings at New York

Paramount interest of protestants is to see that service is performed under "proper conditions"

NEW YORK hearings in connection with the Interstate Commerce Commission's investigation of suspended storedoor pick-up and delivery tariffs of Eastern railroads continued before Examiners Archer and Hosmer throughout the greater part of this week after sessions on Thursday and Friday of last week. The latter, while including some railroad testimony supplemental to that offered in Washington, were devoted in the main to presentations of various shipping interests favoring the railroad proposal. Protestants were heard this week.

As this case develops it becomes clear that few, if any, of the nominal protestants are putting themselves on record as opposed to the principle of storedoor service by railroads—their paramount interest, it appears, is to see that the service is performed under "proper conditions"; and "proper conditions" evidently means a resultant set-up which would leave each non-railroad agency undisturbed in the role which it presently plays in the transportation of l.c.l. The Port of New York Authority, for example, would be willing to have the tariffs become effective on an experimental basis if Manhattan's Union Inland Freight Station, located in the Port Authority Commerce Building, were added to the list of stations at which patrons might receive the proposed allowance for performing their own trucking services; the Brooklyn contract terminals seek assurances that their facilities will be made the bases for Brooklyn services and that the railroads will not bypass them by engaging in direct trucking from New Jersey railheads to storedoors in Brooklyn; the local truckmen, as represented by the Merchant Truckmen's Bureau of New York, would not oppose the service if the allowance were what that organization considers sufficient to permit shippers to continue present trucking arrangements; and the American Trucking Association thinks that the service falls under the Motor Carrier Act and also objects to the absorption of terminal trucking costs in present station-to-station rates.

Wants Allowance at Inland Station

This week's sessions opened with the presentation of the Port of New York Authority which offered first the testimony of W. P. Hedden, chief of its bureau of commerce. One of its interests being the relief of traffic congestion on New York streets, the Port Authority would like to see the c. & d. trucking services performed for all railroads by one agency; also, in the interest of releasing present railroad waterfront pier stations for steamship services, it would like to see coordination of railroad stations into joint facilities. It would not, however, as stated above, object to the present tariffs going into effect on an experimental basis if the Union Inland Station became an allowance point. Mr. Hedden explained the Port Authority position as one suggesting that the commission should keep the record open and hold subsequent hearings to determine how the service is working out in practice.

Describing the Union Inland Station, Mr. Hedden pointed out how it is operated jointly by the railroads through a board of managers. He revealed that the carriers pay to the Port Authority a rental of 10 cents per ton of freight passing through the facility. The railroads, he continued, have sub-let a section of this station to the Railway Express Agency for $48,000 a year while their annual payment to the Port Authority —based on about 60,000 tons of l.c.l. and 90,000 tons of express matter—has been about $15,000. This he calculated to be about five cents per sq. ft. as compared with the average of over 50 cents which the Port Authority receives for other space in the building.

The reason given by the railroads for their failure to list the Union Inland Station as a facility at which the allowance would be paid was that such a listing would cause "two trucking services to exist where otherwise there would be but one." This reason, set out in a letter from D. T. Lawrence, chairman, Traffic Executive Association-Eastern Territory, was "incomprehensible" to Mr. Hedden in view of the fact that it is proposed to pay the allowance at "numerous stations from which no storedoor deliveries will be made" and also at the off-track Manhattan stations of the Erie.

One Trucker and Co-ordinated Stations Advocated

In response to a question from Harry C. Ames, counsel for American Trucking Associations, Mr. Hedden expressed the opinion that the railroads could "come out whole" on the proposed storedoor service only if they introduced into their terminal operations the economies which the Port Authority predicts would follow the employment of a single trucking agency and the development of co-ordinated joint stations.

The Port Authority also called as its witness, J. J. Dowling, superintendent of motor vehicle service for the Railway Express Agency. He testified that the space leased by the Express Agency at the Inland Station has been developed into the Agency's principal Manhattan facility. It did not, however, abandon any facilities which have a direct relation to the Inland Station. It was also brought out that the Express Agency receives 4.5 cents per 100 lb. under its present contracts for trucking Baltimore & Ohio, Central of New Jersey, and New Haven freight between pier stations and the Inland Station; this rate, Mr. Dowling said, is profitable, explaining in response to questions from John F. Finerty, counsel for the Brooklyn Eastern District Terminal, that it is merely a "towing charge" for tractors—the railroads load and unload the trailers.

Mr. Dowling agreed with Wilbur La Roe, counsel for the Port Authority, that street congestion is a "real problem" in Manhattan at all times. Also, that the present set up, with but one express company, is "much better" than was formerly the situation with several such agencies. He told Mr. Finerty in the same connection that there are now about 200 less express vehicles in New York than there were before consolidation, and that the volume of traffic handled is greater.

When Mr. Dowling said that the Express Agency had submitted bids to perform c. & d. for the New York Central, the Central of New Jersey, the Baltimore & Ohio and the New Haven, Parker McCollester, counsel for the Merchants Truckmen's Bureau of New York, endeavored to get the bid figures into the record. Mr. La Roe, objected, saying that he knew the "truckers

would like to know these rates" but that the Port Authority was not interested. Whereupon Mr. McCollester made Mr. Dowling his witness, but failed again to get the figures on record when the examiners sustained objections of counsel for the Express Agency.

Large Shippers Might Make "Profit" on Allowance

Mr. Dowling was followed by F. I. Hardy, a Boston, Mass., truck operator who appeared as a witness for the American Trucking Associations. Mr. Hardy is associated with Big Three, Inc., which performs trucking services under contract for the Boston & Maine and also engaged on its own account in local and over-the-road trucking. He testified that the cost of performing c. & d. trucking for the Boston & Maine in Boston is 8.43 cents per 100 lb., and that the railroad pays his company 9 cents. Mr. Hardy does not think that the proposed 5-cent allowance would cover the cost of trucking generally, although he said that some large shippers could perform their own trucking services at less than five cents. In fact, Mr. Hardy said at another point, there are about 40 shippers which his company decided it would try to make contracts with on a 4-cents-per-100 lb. basis if the 5-cent allowance were put in, thus giving these shippers a "profit" of one cent per 100 lb. out of the transaction. He also said that his company's practice of making deliveries on upper floors for some patrons and on the sidewalk for others is justified under the B. & M. tariffs.

Questioned by Guernsey Orcutt, general attorney of the Pennsylvania, as to the amounts added to his company's over-the-road rates to cover pick-up and delivery, Mr. Hardy gave figures covering terminal services at both ends ranging from 4 cents per 100 lb. on shipments of over 20,000 lb. to 16 cents on shipments of 1,000 lb. or less. It is Mr. Hardy's opinion, he said in response to final questioning, that parity of rates is not the proper railroad answer to truck competition. He objects to the railroads meeting truck rates where the latter's costs are less.

Labor Leader Fears Unemployment Will Result

Thomas P. O'Brien, general organizer of the International Brotherhood of Teamsters, Chauffeurs, Stablemen and Helpers of America, an affiliate of the American Federation of Labor, was the next witness. He was fearful that the small margin upon which the railroads propose to operate storedoor service will tend to lower wage standards in the trucking business and drive out the small operator. He hopes that the Interstate Commerce Commission will not permit an "experiment with what is termed the human machinery." Asked by Mr. Orcutt if the railroads, employing existing local truckers, would force the latter to adopt lower wage standards, Mr. O'Brien thought the tendency would be in that direction if the service were free to patrons.

Replying to J. F. Eshelman, assistant general counsel of the Pennsylvania, the witness agreed that conditions in the over-the-road trucking industry have not been desirable from a labor standpoint. Asked if he were taking a position against the railroads that he wouldn't take against over-the-road truckers, Mr. O'Brien said his only interest was in seeing that there was no reduction in employment. The railroad labor record, Mr. O'Brien agreed, was as good that of truckers but would not agree that this was true of railroad subsidiaries, with which he has dealings; some of these he added, "we find difficult taskmasters to deal with."

The presentation of the Merchant Truckmen's Bureau of New York, which was one of the principal protestants in proceedings which led up to suspension of the tariffs, was opened by that organization's managing director—Arthur G. McKeever, who is also president of the Ajax Trucking Company. Mr. McKeever outlined his organization's position in a statement which followed generally the lines of his recent address before the New York Railroad Club, as reported in the *Railway Age* of April 25. Local truckmen, he said, feel that a fair plus charge should be made for collection and delivery so that railroad patrons could afford to use their own trucks or local truckers. This, Mr. McKeever added, would be a truly optional service. Local truckmen, the witness continued, have never been in competition with railroads—their business is pick-up and delivery but they cannot work with a competitive price of nothing or even five cents per 100 lb. It was Mr. McKeever's further contention that the railroads have a "backlog of responsibility" to the local trucker because he has built his business on long-standing railroad terminal policies. Yet the Erie, he said, has used its own affiliate—the United States Trucking Corporation—for the bulk of its c. & d. work at New York, while the Pennsylvania has reduced its New York contractors to three, two of which were non-existant when P.R.R. storedoor services were inaugurated. Even if he be permitted to participate in railroad c. & d., Mr. McKeever said, the local truckman must relinquish his contact with shippers and work under a contract having a 30-day cancellation clause.

New York Truckmen Want Larger Allowance

In attaching the proposed 5-cent allowance as inadequate the witness referred to P.R.R. testimony revealing that this road pays its New York truckmen 16.5 cents per 100 lb. Asked by Mr. Finerty what he would consider a reasonable allowance, Mr. McKeever was reluctant to name a figure but agreed that the 10 cents suggested by his questioner would not be excessive for shippers in the New York area. In response to a question from Examiner Hosmer, the witness expressed the opinion that it would be feasible to graduate the amount of the allowance.

Under cross-examination by Mr. Orcutt, Mr. McKeever at first said that no member of the Merchant Truckmen's Bureau was an over-the-road trucker. He amended his reply immediately, however, when Mr. Orcutt named a member company that was so engaged, the witness saying that "substantially all" are local truckers and the organization's policies are those of local truckers. In response to another question Mr. McKeever said that the tendency among over-the-road truckers is to permit local truckers to do the pick-up and delivery work, although the over-the-road Bureau member cited by Mr. Orcutt performs its own terminal operations. In this connection Mr. McKeever believes that over-the-road trucking rates, as well as railroad rates, should include an adequate and separable plus charge for terminal services. He would not say that no shipper would accept the proposed 5-cent allowance but he insisted that it is "insufficient to be attractive."

Mr. McKeever was followed by Ted Ficke, president of the Merchant Truckmen's Bureau and president of the John A. Patterson Company, a New York trucking firm. Mr. Ficke said that 80 per cent of New York truckers handle some railroad l.c.l. freight, and he estimated that it accounts for about 20 per cent of their revenue from all local trucking. Another 20 per cent comes from services performed to and from steamship piers and to and from stations of forwarders while only five per cent comes from pick-up and delivery in connection with over-the-road trucking.

Under cross-examination Mr. Ficke told how his company at one time performed trucking for two forwarding

companies—the Universal Carloading & Distributing Company and the National Carloading Corporation. He discontinued his association with the former because it paid too little, while the latter, which paid well, "bounced" his company when "the Erie got ahold." He admitted that if his company could divert business from the forwarder which paid it less to that which paid more, it did so, but he objected to Mr. Orcutt's characterization of such activity as "chiseling." The witness preferred to call it "self preservation." He also admitted that on deliveries as forwarders his company charged some firms but not others for bringing goods above the ground floor. He didn't get paid for such work, he explained, in instances where the carloading company said "take it easy on them and make it up on someone else."

Mr. Ficke was subjected to an extended cross-examination on a study of New York trucking costs which had been made by a committee of the N.R.A. code authority and which the witness introduced as an exhibit designed to bolster his organization's contention that the proposed 5-cent allowance is inadequate.

Sees Railroads Losing Money on Service

The third witness for the Truckmen's Bureau was H. E. Stocker, traffic manager of the American Type Founders Sales Corporation, and a lecturer on transportation at New York University. He introduced a series of exhibits designed to show that the storedoor service as proposed would quite likely be performed at a loss, that it would tend to divert carload business to l.c.l. and that it would disrupt the Eastern class rate structure.

Following Mr. Stocker, the Truckmen's Bureau presented the testimony of two of its member truckmen. After the first of these had been subjected to a brief cross-examination by railroad attorneys he was excused by the examiners as an incompetent witness. The second was not cross-examined.

Isaac Goldberg, president of the Associated Truck Owners, Inc., of New York and managing director of the Master Truckmen, Inc., of America, the Garment Center Truck Owners Association and the New York & Brooklyn Cloak & Suit Truckers Association, appeared to protest against all features of the proposed tariffs. He said that a study which he had made indicated that the railroad proposal would put a great many local truckers out of business. Under cross-examination, however, he admitted that his study was made in 1933, prior to the effective date of the present storedoor tariffs of the Pennsylvania and Erie and that he had made no study of the actual effect of these tariffs on the local truckers. He also admitted that he had at one time approached Chairman Lawrence of the Traffic Executives Association—Eastern Territory, proposing that the railroads employ local truckmen for their collection and delivery work and suggesting that if this were done his opposition to c. & d. would be withdrawn. He is in favor of leaving all collection and delivery work—that of the long-haul truckers as well as the railroads—to the local truckmen.

Mr. Goldberg was followed by Harry H. Shepard, vice-president and general manager of the Brooklyn Eastern District Terminal. Mr. Shepard did not oppose the storedoor service but favored it with a flexible system of allowances. He claimed that economies would result if the Brooklyn contract terminals were used as bases for the Brooklyn operations and the railroads avoided trucking from railheads in New Jersey to the storedoors of Brooklyn patrons. Representatives of Philadelphia trucking interests were scheduled to appear on Thursday.

Warehousing Practices At New York Condemned

WASHINGTON, D. C.

UPON further hearing in Part VI of Ex Parte No. 104, the Interstate Commerce Commission on June 26 issued a report affirming the findings of its previous report and condemning the warehousing and storage practices of seven railroads at the port of New York, the charges assessed therefor and the allowances made in connection with them, as in violation of sections 2, 3 and 6 of the interstate commerce act. This was accompanied by an order requiring the seven roads to cease and desist from the practices criticized by October 1. The practices were initially brought to the commission's attention by complaints of warehouse operators located in the New York district that warehouses, owned or controlled by the railroads or in which they have a financial interest, were being operated in a manner which precluded the complaining warehouses from obtaining much, if any, of the business.

In the previous report the commission said the evidence afforded reasonable ground for the belief that the carriers were violating the Elkins act, but it entered no order, admonishing the railroads to take prompt corrective action. It now says that for some time it has been apparent that although respondents recognize the existing evils, they, for one reason or another, have failed to comply with the findings. By order of May 6, 1935, the case was re-opened for further hearing for the purpose of bringing the record down to date, the evidence being confined to seven Class I carriers with their affiliated or controlled warehousing interests—the Baltimore & Ohio, the Central of New Jersey, the Delaware, Lackawanna & Western, the Erie, the Lehigh Valley, the New York Central, and the Pennsylvania.

Because of the failure to secure concerted action on the part of the carriers, the report says, such attempts as have been made to comply with the finding in the prior report have been ineffectual and most of the practices and charges condemned have not been corrected. In some cases prosecutions under the Elkins act have been instituted but these have been ineffectual in securing compliance with the principles laid down in the report. "It was emphasized at the hearing," the report says, "that the real intent and purpose of the complaining warehousemen is to get the carriers entirely out of the warehousing business," and it is stated that "the record warrants the conclusion that it would be impractical if not impossible for the respondents to engage in commercial warehousing without indulging in such practices."

In an appendix to the prior report the value of railroad outlay in the warehouse projects in the port of New York district was shown to approximate $35,000,000, and the financial loss sustained by respondents in connection with warehousing and storage for the year 1931 was shown as having exceeded $1,260,000. Following is a summary of the principal findings of fact:

1. Each of the seven Class I respondent carriers considered herein provides by tariff publication for storage, handling, and with the exception of the Jersey Central for insurance of carload freight in warehouses, buildings, or piers owned or controlled by it or by companies with which it is affiliated.

2. The storage, handling, and insurance arrangements provided under respondents' tariffs, considered in the discussion herein in connection with the storage of eastbound and westbound carload freight and insurance, are not services incidental to transportation, but are commercial services. Similar commercial services

are performed by competing warehouse companies in the Port of New York district, which are not owned or controlled by, or affiliated with respondents.

3. The tariffs providing said services are a part of a scheme devised to purchase competitive traffic, and through said tariffs the respondents hold themselves out to perform or furnish commercial services under the guise of transportation services.

4. The said tariffs are instruments which work violations of the act, and the services provided by such tariffs are not properly subjects of tariff publication.

5. The respondents deal in and furnish commercial storage, handling, and insurance of goods at rates and charges which do not reimburse them for the full cost of providing such services independent of freight rates, thereby, assuming a part of the cost of conducting the commercial operations of shippers who store goods in their owned, controlled, or affiliated warehouse buildings or piers.

6. The respondents do not assume or bear any part of the cost of conducting the commercial operations of competing shippers who store goods in warehouses operated by said competing warehouse companies.

We find that exclusive of storage and handling directly incident to immediate transportation or immediate delivery of goods, the storage, handling, and insurance of goods under tariff arrangements in warehouses or piers owned or controlled by, or affiliated with respondent carriers, as described of record and discussed herein, are commercial services provided to certain shippers in interstate commerce at rates and charges which fail to compensate said respondents for the cost thereof.

We further find that the provision by respondents of said commercial storage, handling, and insurance at such non-compensatory rates and charges reduces below the published tariff rates, the transportation charges paid by certain shippers in interstate commerce, whose goods are so stored, handled and insured, and results in concessions to said shippers to the extent of the difference between the cost to said respondents of providing such storage, handling, and insurance, and the amount which they receive therefor.

We further find that through such storage, handling, and insurance arrangements, and by granting such concessions the respondent carriers are guilty of unjust discrimination, in violation of section 2 of the Interstate Commerce Act, make and give undue and unreasonable preferences and advantages to certain shippers in interstate commerce, in violation of section 3 of said act, and depart from their published tariffs, in violation of section 6 of said act.

We are not to be understood as here condemning bona fide stoppage and storage in transit as permitted generally by carriers throughout the country, for the purpose of milling, manufacturing, or similarly trade processing the commodities stopped or stored.

We affirm our prior findings that the respondents' warehousing and storage practices, charges assessed therefor, allowances made in connection therewith, and the insurance of goods as hereinbefore described at the Port of New York district, dissipate respondent's funds and revenues, are not in conformity with efficient and economical management as contemplated by the Interstate Commerce Act, and not in the public interest.

The cease and desist order requires the carriers to abstain after October 1 from publishing or keeping on file with the commission tariffs naming rates and charges for the leasing of space, storage, handling, and insurance of goods in connection with commercial warehousing services as defined and described in the reports (which do not include such storage, handling, and insurance as is directly incident to transportation), and to cancel the tariffs now on file.

Chairman Mahaffie, dissenting in part, said that while agreeing that the situation developed by the investigation is bad and ought to be corrected he was not satisfied that there was an adequate basis for some of the findings made and for parts of the orders entered. He said in part:

"To justify a finding that the storage charge paid by a shipper results in a preference to him and a discrimination against other shippers or operators of warehouses there is required, as I view it, a preliminary finding that the charge is less than just and reasonable for the particular service rendered. A finding that the warehouse is operated at a loss will not suffice. The warehouse may be badly located, expensive to operate, or may have cost too much initially. Present value may be only a fraction of original investment. The fact that operations as conducted do not pay operating cost, taxes, and return on investment, considered alone, is not controlling on the specific question whether an individual user is being unduly preferred. The extent of occupancy, among other factors, must also be considered. I think it obvious that charges based on 100 per cent occupancy do not necessarily become preferential when half the tenants move out and the use of the warehouse drops to 50 per cent. Reasonable rates charged for storage cannot be raised as occupancy decreases as they would have to be to return at all times the full cost of the enterprise.

"The principle that a carrier service may not lawfully be afforded at less than full cost, including depreciation, if applied generally would terminate a great many carrier operations. In my judgment, it is not a sound principle."

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended June 20 totaled 690,716 cars, an increase of 3,904 cars as compared with the week before and of 123,667 cars, or 21.8 per cent, as compared with the corresponding week of last year, when coal loading was light following a heavy movement in anticipation of a miners' strike. All commodity classifications showed increases over last year's figures but merchandise, coal, and coke showed reductions as compared with the week before. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended Saturday, June 20

Districts	1936	1935	1934
Eastern	146,654	129,846	133,768
Allegheny	137,563	113,731	125,703
Pocahontas	45,992	36,434	42,263
Southern	95,067	78,838	82,364
Northwestern	113,339	82,855	92,744
Central Western	98,883	82,186	95,979
Southwestern	53,218	43,159	50,501
Total Western Districts	265,440	208,200	239,224
Total All Roads	690,716	567,049	623,322
Commodities			
Grain and Grain Products	34,064	25,081	39,534
Live Stock	11,686	9,082	15,290
Coal	103,993	87,645	98,272
Coke	8,297	5,603	6,744
Forest Products	34,380	25,954	24,835
Ore	50,485	32,432	34,412
Merchandise L.C.L.	160,889	155,226	160,234
Miscellaneous	286,922	226,026	244,001
June 20	690,716	567,049	623,322
June 13	686,812	652,111	618,881
June 6	695,845	629,712	616,768
May 30	646,859	562,682	579,656
May 23	683,406	598,396	625,990
Cumulative Total, 25 Weeks	15,877,231	14,543,866	14,790,620

Car Loading in Canada

Car loadings in Canada for the week ended June 20 totaled 45,740 cars, as compared with 43,580 cars for the corresponding week in 1935 and 45,920 cars for the previous week, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total For Canada:		
June 20, 1936	45,740	22,172
June 13, 1936	45,920	22,385
June 6, 1936	45,002	22,867
June 22, 1935	43,580	21,483
Cumulative Totals For Canada:		
June 20, 1936	1,078,917	588,773
June 22, 1935	1,068,549	559,727
June 23, 1934	1,048,169	581,036

Tax for Retirement Pensions Enjoined

D. C. court finds two acts must be taken together and are just as unconstitutional as 1934 pension law

WASHINGTON, D. C.

HOLDING that the provisions of the railroad retirement act of 1935 and the tax act passed at the same time are "so inter-related and inter-dependent that each is a necessary part of one entire scheme," and that the tax act was an attempt by Congress to accomplish under its taxing power a compulsory pension plan which the Supreme Court had held it had no power to impose under the power to regulate interstate commerce, Justice Jennings Bailey of the federal district court for the District of Columbia on June 26 issued an opinion finding the tax act unconstitutional and an order enjoining its enforcement.

In issuing his formal decree on June 30, however, the court left for the government an interesting problem by explaining that although he had referred to the retirement act also as being unconstitutional, his order was not intended to prevent the Railroad Retirement Board from paying pensions out of the general funds of the government, as the act had authorized the appropriation of such money from time to time out of the Treasury of the United States as might be necessary to carry it into effect. Murray W. Latimer, chairman of the board, said that conferences with Treasury officials would be necessary before a decision could be reached as to the course to be pursued.

The decision was rendered following several weeks of testimony and argument on the bill of complaint filed by the railroads, attacking the constitutionality of the two laws proposed by the Railway Labor Executives' Association as a substitute for the retirement act of 1934, which the Supreme Court of the United States declared unconstitutional as not a proper regulation of interstate commerce. As Justice Bailey points out in the decision, the legislative history of the two acts showed they had been written and passed on the theory that the money could be raised under the taxing power of Congress and that the pensions could be paid by the government under the other law without reference to the source of the funds.

Justice Bailey finds, however, as contended by the railroads, that the pension system so created is substantially the same as that proposed by the act of 1934, that apart from its unconstitutionality as a whole it is subject to the same objections in certain particulars as those pointed out by the Supreme Court in the previous case, and that "here it is evident that the use of the taxing power (of Congress) is to accomplish that which is beyond its powers."

The Railroad Retirement Board and its individual members were enjoined "from making any order, or from instituting or taking any step toward the institution of any actions, proceedings, or prosecutions, designed to compel plaintiffs or their officers or any of them to assemble, compile or furnish any of the information and records required, or which may be required, to be furnished under said retirement act." Also the commissioner of internal revenue was enjoined from making any order or taking any steps to compel plaintiffs to pay any amount pursuant to the tax act.

In the final decree, however, a proviso was inserted that nothing in the order should affect or qualify the right of the board to examine the records of the carriers at its own expense, including all expenses that may be necessarily incurred in making the records available. It was also ordered that until the final determination of all appeals in the case, such sums as have been or may be collected by any plaintiff carriers from their employees by deducting from their compensation shall be held in special accounts, subject to the order of the court, and that the carriers shall on July 31, September 30, and quarterly thereafter, make reports to the court of the amounts so held. This will make it possible for the railroads to collect the amounts which were to be paid by the employees pending final outcome of the litigation, as it would be difficult to collect them later retroactively, but the government is prevented from collecting any amounts under the tax act.

The two acts were approved by the President on August 29, 1935. The tax act provides that there shall be levied upon the income of every employee of the carriers a tax of 3½ per cent of his compensation not in excess of $300 a month, to be collected by the employer by deducting it from the compensation of the employee. The retirement act provides for the payment of retirement annuities by the federal government.

The amount of the tax imposed on the railroads for this year had been estimated at about $58,000,000. The Railroad Retirement Board had planned to begin the payment of pensions on July 1, but instead it is now planning for an appeal from the decision to the higher courts. In the previous case the decision of the supreme court of the District of Columbia was appealed direct to the Supreme Court of the United States. If the law should be held unconstitutional by the Supreme Court the exemption of the railroads from the provisions of the social security act would also be removed. Under that act they would be required to pay a tax beginning at 1 per cent of the payroll in 1937 and gradually increasing to 3 per cent.

A condensation of Justice Bailey's opinion follows:

Justice Bailey's Opinion

The plaintiff carriers and certain employees of the Atlantic Coast Line Company, who have intervened, contend that this tax upon them is arbitrary, capricious and whimsical and deprives them of their property without due process of law. It is not apparent from the act itself what is the basis of its unusual provisions. The tax is in addition to other taxes; it is levied upon railroad companies and their employees, and upon no other class, with the exception of certain officers of labor organizations. The income tax is laid upon the amount of employees' salaries not in excess of $300 per month, and all sums in excess of that amount are exempt. It bears harder upon low salaries than upon those that are higher, and is thus contrary to all principles which have heretofore been followed in the levying of income taxes. . . . The basis of measurement of the amount of the tax upon the carriers does not appear from the act, nor why a tax should be levied upon the carriers and their employees and upon no other class of employers or employees, nor why the amount of the excise tax should be based upon the amount paid to employees not in excess of $300 per month. "That a federal statute passed under the taxing power may be so arbitrary and capricious as to cause it to fall before the due process clause of the Fifth Amendment is

settled." *Heiner* v. *Donnan*, 285 U. S. 326. And such would seem to be the character of this tax, were the court confined in its consideration to the taxing act itself.

When, however, the act to establish a railroad retirement system, approved on the same day as the taxing act, is considered in connection with it, the reasons for the peculiar provisions of the taxing act are apparent. The two taken together so dovetail into one another as to create a complete system substantially the same as that created by the Railroad Retirement Act of 1934, held unconstitutional by the Supreme Court in *Railroad Retirement Board* v. *Alton Railroad Co.*, 295 U. S. 330. It is true, as claimed by the defendants, that the tax act is apparently based on the power of Congress to levy taxes to promote the general welfare and for the common defense, and also upon the power to regulate commerce (the latter being the power invoked in the Act of 1934).

Two Acts Interdependent

The provisions of the two acts in question are so interrelated and interdependent that each is a necessary part of one entire scheme. This is not only apparent from the terms of the acts themselves but is shown by their legislative history. It was clearly the intention of Congress that the pension system created by the retirement act should be supported by the taxes levied upon the carriers and their employees. Senator Wagner spoke for the Senate committee in reporting its favorable recommendation of the retirement act.

Section 6 (b) of the retirement act provides that the board—

> * * * at intervals of not more than two years shall cause to be made actuarial surveys and analyses, to determine from time to time the payments to be required to provide for all annuities, other disbursements, and expenses, and to assure proper administration and the adequacy and permanency of the retirement system hereby established.

Senator Wagner said:

> The calculations are definitely made; they are predictable as to the amount which will be required in order to secure a solvent fund for the payment of these pensions; and a sufficient tax is imposed to secure that fund. So whether it be segregated or put into the general fund of the treasury is really a very minor matter. (Cong. Rec. Vol. 79, 13649; Pamphlet 14117, 14118.)

The defendants claim that the court, in determining the constitutionality of the taxing act, cannot take into consideration the provisions of the retirement act, that the funds arising from the taxing act are not "ear marked," not kept as a separate fund for the payment of the pensions provided for in the retirement act, and so far as the constitutionality of the taxing act is concerned its provisions alone can be considered. But apart from any question whether the tax act is so arbitrary and capricious when taken out of its setting as to be an unconstitutional taking of property without due process of law, the purpose of Congress in passing it is clearly as shown above to provide funds for pensions under the retirement act, and not to provide for the expenses of the government. If the effect of the two acts taken together is to take the property of one class for the benefit of another, and the taxing act was not intended to provide for the expense of government, but solely for a purpose which the Supreme Court has held not to be within the domain of the federal government, it would seem to be immaterial whether the funds raised by the tax act are to be segregated in the Treasury; that would be a mere matter of bookkeeping, and would not affect the right of the taxpayer. This view is supported also by the proceedings in Congress bearing on these two acts.

Discussion In Massachusetts Case Inapplicable

The defendants rely largely upon the decision of the Supreme Court in *Knights* v. *Jackson*, 260 U. S. 12, where the court declared that it could not connect a Massachusetts statute increasing a general income tax with an act directing the payment for educational purposes of certain sums to cities and towns out of the proceeds of the entire income tax. The court held that the use of the proceeds of the tax for educational purposes was not unlawful, and that the two acts could not be connected for the purpose of attributing to the legislature an attempt to achieve by indirection a result supposed to be beyond its power. In the case at bar, however, the interlocking and interdependent provisions of the two acts, and their legislative history do show an attempt by Congress to accomplish under certain of its powers an end which has been held to be unconstitutional. Of course Congress may accomplish under one power that which it may not do under another, but here it is evident that the use of the taxing power is to accomplish that which is beyond its powers.

The court has held that so far as the system of pensions created by the act of 1934 is concerned, there is no "power of legislative regulation."

The defendants contend that the act of 1934 provided for permanent contributions from the carriers and employees, while the tax act of 1935 is temporary in its nature. But the provision in the retirement act for "actuarial surveys," and the legislative history of the two acts show the purpose of Congress to establish a permanent system.

I think that, from what has been said, it necessarily follows that the two acts are inseparable parts of a whole, that Congress would not have enacted one without the other, that the taxes levied under the tax act are the contributions required under the act of 1934, and that to hold otherwise, would in the language of the Supreme Court in the Butler case "shut our (my) eyes to what all others than we (I) can see and understand."

Proposed Pension System Same As That of 1934

This being true it is clear that under the views of the Supreme Court in the Alton case the taxing act transcends the powers of Congress. The pension system so created is substantially the same as that created by the Act of 1934, and apart from its unconstitutionality as a whole subject to the same objections in certain particulars as those pointed out by the Supreme Court in that case.

Were it not for the fact that the defendants have introduced a large amount of testimony in the effort to disprove certain conclusions reached by the court in that case, it would hardly be necessary to discuss any of those questions.

It is unquestionably true that the carriers are engaged in the public service and one indispensable to the general welfare and the common defense; that as men grow old their physical powers decrease, and their mental powers also; that largely due to the seniority system in force with many of the carriers taken in connection with the recent depression, there has been in recent years an increase in the average age of railway employees, and the defendants contend that in view of the increasing speed in transportation, the older men are not so well fitted for the duties now being imposed upon them, and that a pension system is a reasonable method of reducing superannuation. On the other hand however it is no less true that the capacity to perform duties once learned does not decrease with age so rapidly as does the capacity to learn new duties; that experience and the added caution attendant with it tend to promote safety as well as efficiency.

Testimony has also been offered to show that since the adoption by the government of a compulsory system of pensions in the railway mail service the efficiency of the employees has been increased. The plaintiffs, however, have offered testimony to show that, despite the increase in speed of trains in recent years, and the increasing age of employees, there has been a decrease in the number of injuries to employees and to passengers per man hour. How much either of these results has been reached by improvements in management or in system or through the use of safer devices or equipment is not apparent, but it cannot be said that the increase in the average age of railway employees has resulted in any greater danger to the employees or to passengers upon the railroads.

It may be that men would be more willing to undertake the duties now performed by the employees of the carriers and with the intention of making that employment a permanent occupation were they assured of a permanent livelihood in their old age and not have to rely upon a pension dependent upon the will of their employers.

But whether the findings of the Supreme Court in the Alton case are findings of fact based upon the record in that case or upon facts of which that court took judicial knowledge, it would require evidence, practically conclusive in its nature, to justify a trial court in making findings that were not in consonance with those of the Supreme Court. No such situation exists in the case at bar. The evidence is conflicting as to many questions of fact and, whatever might be my individual views, I am bound by the decision in that case, which disposes of any question as to the validity of a compulsory pension system based in part upon enforced contributions from the carriers, and I feel that

I am constrained therefore to hold that the tax act is unconstitutional as applied to the carriers.

As to the questions raised by the intervening employees of the Atlantic Coast Line Company:—The decision in the first Alton case apparently does not pass upon the question whether a compulsory retirement system, financed in whole or in part by compulsory contributions from the employees themselves, would be unconstitutional. The system set up by the two acts in question here, however, seems to be subject to many of the constitutional objections raised by the Supreme Court in the Alton case, notably in the reduced annuities if the employee wishes to continue in service after reaching the age of sixty-five; the provision as to payment to persons who have reached the age of sixty-five, at the date of enactment of the retirement act; and provisions for retirement of those whose services have been performed before the date of the act, and who may have contributed nothing in support of the retirement system.

In addition to this it is clear from the statements of those in charge of the two bills that Congress did not intend to enact them, if the expense was not to be borne in part by the carriers, and that no part of the burden should rest upon the government.

The defendants have moved to dismiss both the bill and the intervening petition upon the ground that equity has no jurisdiction, relying upon R. S. 3842.

> No suit for the purpose of restraining the assessment or collection of any tax shall be maintained in any court.

The Supreme Court has held that where the remedy at law is sufficient the act controls, but that

> In cases where complainant shows that in addition to the illegality of an exaction in the guise of a tax there exist special and extraordinary circumstances sufficient to bring the case within some acknowledged head of equity jurisprudence, a suit may be maintained to enjoin the collector. *Miller* v. *Nut Margarine Company*, 284 U. S. 498.

I think that the case at bar presents extraordinary circumstances, rendering relief in equity necessary. It is clear that if this tax be illegal, the carriers will suffer irreparable loss. There will be serious disruption in the relations between the carriers and their employees. Many employees will have relinquished their employment with the carriers within the next year, upon the assumption of the permanency of their annuities provided for in the retirement act, and their positions will be filled by others. Rate adjustments may depend upon the validity of the tax. Reorganization plans will be delayed. Great accounting expense will be imposed upon the carriers, and this will be necessary from the fact that exact records are available only in the offices of the carriers. The cost of this will approximate some $700,000, and this sum would be entirely lost if the tax should hereafter be declared illegal in an action at law.

For these reasons I think that equity has jurisdiction of this suit.

The plaintiffs have moved to strike certain testimony introduced by the defendants, and the latter have moved to strike certain testimony offered by the plaintiffs. While certain of the matters brought out by the defendants' questionnaires are, I think, incompetent, they have had no influence on my decision, and, without going into detail as to my reasons, I overrule both motions, largely because I think the testimony objected to as of slight materiality.

North Western Files Reorganization Plan

THE management of the Chicago & North Western has filed in the federal court at Chicago a plan of reorganization under which all fixed interest obligations (except equipment trust certificates and bank and government loans) would be exchanged in part for new fixed-interest obligations, but for the most part would be replaced by income obligations. Equipment and P.W.A. loans, totaling $14,722,000, would remain intact, and $48,450,133 of notes held by banks, and by the R.F.C. and R.C.C. would be replaced by fixed-interest obligations of equal amount. However a total of $233,486,000 of bonds bearing interest at 3½ to 5 per cent would be exchanged for only $66,667,000 of fixed interest obligations—new income obligations to be issued to make up the difference between the new issue at fixed interest and the nominal price of the old issues, plus a distribution of prior preferred and common stock in lieu of interest arrears.

The plan would reduce fixed interest requirements from approximately $17,000,000 at present to $4,662,705, with contingent interest obligations of $7,476,820—a total of $12,139,525. Holders of various mortgage bonds would receive the following percentages in new 3½ per cent series B bonds (the balance of the nominal value of their present holdings to be made up with series C income bonds):

Present Bonds	% in New Series B Bonds
General Mortgage—3½s	25
General Mortgage—4s	28
General Mortgage—4½s	30
General Mortgage—4¾s	32
General Mortgage—5s	33
15-Year Secured Bonds	33
Sioux City & Pacific 1st 3½s	32
Milwaukee & State Line 1st 3½s	34
Manitowoc, Green Bay & N. West'n 1st 3½s	31
St. Paul Eastern Grand Trunk 1st 4½s	29
Milw., Sparta & Nor. Western 1st 4s	28
Des Plaines Valley 1st 4½s	32
St. Louis, Peoria & Nor. Western 1st 5s	31
First & Refunding Mortgage—5s	22
First & Refunding Mortgage—4½s	20

Loans from the Reconstruction Finance Corporation, the Railroad Credit Corporation and banks totaling $48,250,133 would be refunded by an issue of an equivalent amount of series A bonds. Holders of 20-year convertible bonds would receive 3 per cent debentures in their stead, and a like issue would be used to pay general creditors and deferred interest to banks and the R.F.C. Each holder of a present mortgage bond would also receive one share of new 4 per cent prior preferred stock and one share of new no-par common for each $1000 bond.

Present preferred stock, outstanding in the amount of $22,395,000, would be exchanged one share of new 4 per cent preferred and one share of new no-par common for each two shares of present preferred (plus a purchase right to further common within eight years at prices ranging from $10 in 1937 to $75 in 1944). Present common stock would be exchanged, two shares of the old for one of the new (plus a purchase right).

Fixed interest obligations outstanding, should the plan be made effective, would be approximately as follows:

Equipment trust certificates	$13,362,000
P.W.A. notes	1,360,000
Series A Bonds	48,250,133
Series B Bonds	66,667,000
Total	$129,639,133

Non-cumulative income obligations and stock would be as follows:

Series C bonds	$169,774,000
3½ debentures	79,453,000
4% Prior preferred stock	23,644,100
4% Preferred stock	11,197,500
No-par common stock (valued at $100 a share)	114,061,600
Total	$398,130,200

The average income available for fixed charges for the five years ended 1935 was slightly over $6,000,000; for the five years ended 1929, somewhat more than $25,000,000. The ratio of fixed interest obligations to total capitalization under the proposed plan would be approximately 25 per cent.

C.G.W. Truck Tariffs Approved by I.C.C.

WASHINGTON, D. C.

TARIFF schedules filed by the Chicago Great Western to become effective on March 10, proposing to establish rules and charges for the transportation on railroad flat cars of motor vehicles loaded with almost any kind of freight between Chicago and the Twin Cities, which had been suspended by the Interstate Commerce Commission pending an investigation, were found justified in a report of the commission issued on June 26 together with a report vacating the suspension order. At the same time, the commission voted not to vacate or modify its order of June 5 suspending a tariff filed by the Keeshin Motor Express Company in which the Chicago Great Western and numerous other motor carriers were participants, providing for joint rail-truck rates between eastern and western points in connection with the railroad, on which oral argument was heard by the commission on June 15. The latter tariff represented a later arrangement between the railroad and the Keeshin company for co-ordinating their rail and highway service and if it had been permitted to go into effect it had been planned to withdraw the schedules which have now been found justified.

The C. G. W. tariff had been suspended on protest of several of the principal western trunk line railroads, not including the Chicago, Rock Island & Pacific, which had had a similar arrangement in effect, and of commercial interests of Minneapolis and St. Paul and the South Dakota railroad commission. In reply to the railroad protests the commission says that "it should be borne in mind that the traffic which the Keeshin company proposes to turn over to respondent for a partial rail haul is now moving by motor vehicle between the same points at the same through rates as it is proposed to apply to the joint motor-and-rail service."

The report includes calculations to show that the proposed charge of $42.50 for a loaded vehicle, reduced to charges per 100 pounds, is equal to rates varying from 21 to 35.5 cents per 100 pounds, according to various weights that may be loaded, ranging from 12,000 pounds to 20,000 pounds; that the present class rates of the rail carriers between Chicago and the Twin Cities range from 22 cents to $1.26, and that the Keeshin company's rates between Chicago and the Twin Cities range from 60 cents for sixth class to $1 for first class.

The commission finds that the proposed rates are a means of co-ordinating truck and rail transportation and that the proposed rates are practically container rates.

Commissioners Lee, McManamy, and Tate dissented, and Commissioner Caskie, concurring, expressed the opinion that co-ordination would be more fully and effectively attained by the establishment of joint rates than by the method here proposed.

The majority report included the following:

There is a heavy movement of package goods and other freight by motor vehicles between Chicago and the Twin Cities, and between points south and east of Chicago, on the one hand, and points north and west of the Twin Cities, on the other. Respondent seeks a rail haul on this business as an intermediate carrier. The proposed schedules would enable traffic to move without break of bulk over motor-rail-motor routes, without joint motor-rail-motor rates. They are the result of negotiations between respondent and the Keeshin Motor Express Company, Incorporated, hereinafter called the Keeshin company, for through movement whenever the Keeshin company may desire to ship its motor vehicles by railroad between Chicago and the Twin Cities instead of driving them over the highways. The Keeshin company has been operating between these points for over 8 months, averaging per day in each direction about 10 vehicles, principally loaded semi-trailers having a tare weight of about 7,500 pounds each. The vehicles have a capacity of about 20,000 pounds, or about one-third as great as a standard 40-foot box car, and on the average are loaded to about 15,000 pounds. Ordinarily they are fully loaded northbound and loaded to about 80 per cent of capacity southbound. Efforts are being made by the Keeshin company to balance and greatly increase the traffic. If the suspended schedules become effective the Keeshin company expects to use respondent's services for the entire movement between Chicago and the Twin Cities, continuing highway operations between these points only for way freight. Respondent hopes by the proposed schedules to regain much of its lost traffic. It estimates that it might earn from a quarter of a million to a million dollars per year additional revenue, which is highly desirable, particularly in view of its present financial condition. Moreover, it is of the view that in the interest of public safety it would be a good thing to reduce the number of such vehicles on the highways.

The proposed schedules are not limited to the Keeshin company or any other motor carrier as a shipper, but would be open to the general public. They could be availed of, for instance, by freight forwarding agencies and other large shippers of miscellaneous freight, such as mail-order houses and dealers in general merchandise. The relation between the motor carrier and respondent would be that of shipper and carrier. The motor carrier would be responsible to the shipper for any loss or damage, but could make claim against respondent just as could any other shipper. The motor carrier's rates from points of origin to destination would apply on the articles comprising the shipments.

Respondent decided upon the use of a tariff open to all parties, whether shippers or motor carriers, because the rail carriers of the country were understood to be on record as generally opposed to joint rates with truck carriers, except where the latter could be used as feeders. Respondent's objective could, in its view, be better accomplished by the establishment of joint motor-rail-motor rates with its motor connections, for the reason that in such event the proportion of the charge accruing to respondent would not be open to the use of shippers. Shipper protestants in this proceeding indicated that they were not opposed to such joint rates. Since the hearing herein schedules of such rates have been filed by respondent and the Keeshin company and other motor carriers, proposed to become effective June 8, 1936. Obviously those rates could not be availed of by any shipper offering shipments in his own truck or by any motor carrier which was not a party to the schedules. Upon protest of numerous rail carriers, and others, these schedules have been suspended in *Investigation and Suspension Docket No. 4210*, not yet heard.

The charges proposed are considerably lower than those now in effect on similar vehicles when empty, and on the various articles of freight that would constitute the loads, the class bases being generally applicable at present. For each loaded motor vehicle the proposed charge is $42.50, subject to a minimum of $85 when less than two vehicles are offered for shipment on one day. For empty-returned vehicles one half of these amounts would apply. However, respondent contemplates a change in the schedules. It would make the minimum charge for the first car used on any day in either direction, whether loaded with one or more loaded or empty vehicles, $85 and for each additional car the charge would be $42.50 for each loaded vehicle and $21.25 for each empty-returned vehicle. At the figures mentioned the net weight of the lading on the flat car is not to exceed 20,000 pounds for each vehicle, loaded or empty, but there would be a tolerance of 5 per cent, the excess, up to 1,000 pounds, being chargeable on a proportionate basis.

As may be seen, the rail rates on the first four classes of traffic, which would constitute the bulk of the motor vehicle loads, are several times as high as the proposed charges per 100 pounds. However, the rail lines between Chicago and the Twin Cities maintain all-freight rates of 55 cents, minimum 40,000 pounds; 72 cents, minimum 20,000 pounds; and 91 cents, minimum 10,000 pounds, together with an all-grocery commodity rate of 39 cents, minimum 24,000 pounds; these rates being used by large shippers of merchandise.

The Keeshin company also maintains all-commodity rates of

46 cents northbound and 41 cents southbound between the considered points for loads of 20,000 pounds. Sight should not be lost of the fact that the less-than-carload class rates of the rail carriers, and all the rates of the motor carriers, include pick-up-and-delivery, loading and unloading, and line-hauls on many individual pieces of freight, whereas the proposed rates cover only the simple movement of containers from team track at point of origin to team track at destination. The traffic is to be handled under circumstances and conditions substantially different from those surrounding ordinary carload or less-than-carload traffic. As the service which respondent would perform under the proposed schedules differs from and is substantially less than it performs on less-than-carload traffic, particularly when pick-up-and-delivery service is rendered, it would be necessary, when the general public used the proposed rates, to use other facilities to supplement service performed by respondent.

The charge of $42.50 per loaded motor vehicle represents the estimated road-haul cost, 10 cents per mile, of moving a vehicle over the highways between Chicago and St. Paul, the distance being about 425 miles. City terminal expenses are excluded. Ten cents per mile is approximately the cost shown by a study made by the Keeshin Company. It purports to include all items except interest on investment. A study made by respondent covering movements of a truck carrier between Chicago and Dubuque, Iowa, a distance of 184 miles, showed a cost of 7.7 cents per mile. To further support the estimate of 10 cents per mile respondent refers to a merchandise traffic report issued by the co-ordinator of transportation. It concludes from the data therein, which covers a wide survey, that the co-ordinator found average freight motor vehicle costs in 1932 to amount to about 10.5 cents per mile for an average load of 10,000 pounds and for an average distance of about 130 miles. The Keeshin company has indicated to respondent that a charge approximating 10 cents per mile is all that the traffic could bear. All of the expenses entering into the total cost would not be saved by rail movement of the vehicles between Chicago and the Twin Cities. Most of the charges for depreciation; license fees, except in Wisconsin; and insurance would not be materially affected. The time in transit would be about the same as at present. However, the motor carrier would escape the hazards of the road, especially those incident to the heavy snow of the winter months, and some of the ill will of the public incident to the use of the highways by freight vehicles.

Respondent urges that the rates and charges proposed, although perhaps below reasonable maxima, would, under the particular circumstances, be amply compensatory for the service performed. The traffic to the extent that it represents freight which would otherwise move over the highways, would be added traffic. It could be used to fill out existing freight trains and transported at small extra cost. It would move in through trains with a minimum amount of terminal switching. No switching charges would have to be absorbed.

Respondent expects to average two loaded motor vehicles per car, yielding $85 per car. At rates prescribed by the commission grain traffic from the Twin Cities to Chicago yields about $80 per car, and livestock, which has to be loaded and unloaded at the carrier's expense, and entails nearly 100 per cent empty car mileage, yields about $70 per car. Still lower charges, prescribed by us are made on some traffic. On all freight traffic in 1935 respondent had an average revenue of about $65 per car for an average haul of about 306 miles. Car-mile earnings on the anticipated traffic would be about 20 cents. On all of respondent's traffic in 1935 they were 21.25 cents, but on its strictly local traffic they were approximately 32 cents. During that year respondent had 63.5 empty car-miles for every hundred loaded car-miles. On the traffic here in prospect it expects practically no empty car mileage.

The record affords no rail-carrier expense data for the year 1935, but in 1934 respondent's freight expenses for all car-load traffic were about 22.5 cents per car-mile, the average haul was about 315 miles, and the average expenses per car about $70. Although respondent's expectations respecting earnings on this traffic may be too optimistic, it is evident that the yield per car could be considerably less than $85 and still be compensatory, particularly on the out-of-pocket basis, which assumes that the cost of handling added traffic is about half as great as the cost of handling other traffic. While individual articles which would probably comprise most of the traffic here considered take much higher rates than freight traffic generally, there is no indication that the cost of transporting them as proposed would be greater than the cost for other traffic.

Schedules similar to those here before us have been maintained by respondent for about 3 years between Chicago and Dubuque. The charge for loaded vehicles is $22.50, and that for emtpy-returned vehicles $11.25, for a distance of 172 miles. These charges were used for about 6 months, but there is now no movement under them. It is stated that a reduction of at least $4 would be necessary to return the traffic to the rails. The Chicago, Rock Island & Pacific publishes, in a tariff similar in form to that here concerned, charges the same in amount as those just mentioned between Chicago, on the one hand, and Davenport, Iowa, and Rock Island, and Moline, Ill., on the other, for an average distance of about 181 miles. Electric lines between Milwaukee, Wis., and South Bend, Ind., publish similar schedules. The Alton Railroad Company formerly published a similar schedule that applied between Chicago and East St. Louis, Ill. Division 2 authorized schedules of similar character for application by the St. Louis Southwestern Railway Company between St. Louis, Mo., on the one hand, and important points in Arkansas, on the other, in *Vehicle Container Rates in Southwest,* 196 I.C.C. 127. However, the charges under those schedules approximated 16 cents per highway mile.

The protestant western trunk-line rail carriers fear that if the proposed schedules go into effect they will unduly promote the interests of the truck carriers to the great detriment of the rail carriers; that they will unduly prefer Chicago and the Twin Cities; that many large shippers who are now sending their traffic by rail at reasonable rates will bring their loaded motor vehicles to respondent's stations, and ship them under the proposed schedules; that great quantities of merchandise now moving by rail and consisting of thousands of carloads will go by motor vehicle at the proposed rates or rates made to meet them; and that similar rates, based on the estimated motor vehicle cost of 10 cents per mile, will soon be demanded and established between many other points and ultimately become general, breaking down present rate structures and entailing upon protestants staggering losses in revenue. However, it should be borne in mind that the traffic which the Keeshin company proposes to turn over to respondent for a partial rail haul is now moving by motor vehicle between the same points at the same through rates as it is proposed to apply to joint motor-and-rail service.

Protesting commercial interests of Minneapolis, St. Paul and other cities in the Northwest fear that the establishment of the proposed charges would result in their customers' buying more largely from Chicago distributors who might ship their motor vehicles on flat cars. Merchandise in large volume is now moving by rail from Chicago and points east and south thereof to protestants and being distributed by them. To be sure of retaining some of this business protestants themselves are considering the matter of shipping merchandise in motor vehicles at the proposed charges.

Considerable question arises as to whether it would be practical for individual shippers to develop their private motor vehicle operations to the point where it would be worth while to assume the burdens incident to the use of the proposed charges. Respondent states that it would withdraw the schedules if experience should later show that there was any tendency to bring on the dire consequences which protestants claim would follow their establishment.

Protestants contend that there is a much wider difference between the rail rates on the individual articles of traffic and the charges proposed by respondent for the motor vehicles loaded with the same articles than is justified by the difference in service. In this connection it is pointed out that a party who could ship a vehicle loaded with some particular commodity, or with various kinds of merchandise, would have a much lower rate and a decided advantage over competitors who could make only small less-than-carload shipments of the same articles. The proposed rates are practically container rates.

The purpose of the proposed schedules is to furnish this service in response to a demand for it between the points named therein. At the argument, respondent's representative stated that should a demand for similar service develop from and to intermediate points, it would promptly arrange for such service and provide rates on the same basis as those under consideration. Our views in this matter are aptly expressed in the above quotation from our report in *Container Service, supra.*

Protestants also contend that as the motor carrier's certificate

and tariffs do not provide for routing over respondent's line, the latter may not lawfully be used in transporting through shipments from and to points beyond respondent's terminals at Chicago and the Twin Cities. However, we are considering here a matter of operating convenience and not one of routing in which the original shipper has an interest. So far as he is concerned the Keeshin company is the carrier from origin to destination. Respondent's service between Chicago and the Twin Cities on through shipments coming from or going to points beyond by motor vehicle is in the same category as the motor vehicle service between St. Louis, Mo., and East St. Louis, Ill., on through shipments over the line of the Wabash Railway Company, for instance, from points in Missouri to points in Illinois, the movement in the latter case being under a strictly local rate of the Wabash. In both instances the "bridge," or intermediate service is performed by a different agency of transportation.

A schedule must appear to violate the terms of some particular provision of the interstate commerce act before we can find it not justified. The mere fact that we may consider its establishment unwise is not necessarily sufficient warrant in itself for its condemnation.

Odds and Ends . . .

Railway Bridge Stamps

H. W. Howard of the Canadian National advises that the 1898 Trans-Mississippi stamp is not the only one bearing a picture of a railway bridge. He states he has a 5-cent issue of the Pan-American Exposition of 1901 which bears a picture of the suspension bridge at Niagara Falls.

Joint Birthdays

When the Super-Chief of the Atchison, Topeka & Santa Fe made its first run on May 12, it was revealed that that date was also the birthday of S. T. Bledsoe, president of the Santa Fe. Moreover, Mr. Bledsoe's daughter, Mrs. Bartlett Cormack, who christened the train, was also born on May 12. All of which reminds us that F. W. Rosser, general manager of the Western district of the Erie, his wife and his son, were all born on April 19.

Train Forced to Retreat by Army of Caterpillars

Caterpillars counted a victory over a train recently in the plague which is sweeping Ontario. The crawlers crept on to a track of the Canadian National, clustered thereon in thick masses and stopped a train enroute to Mackie. It had to return to Fort William. Other trains made only half their speed because of the slippery condition of the tracks. Railway officials are equipping an engine with a blower that will emit steam at a pressure of 200 lb. a square inch.

Railway Flower Show

PHILADELPHIA, PA.

TO THE EDITOR:

The century old Pennsylvania Horticultural Society proposes to break all former traditions by staging at its annual Dahlia and Fall Flower Show a section for the employees of railroads and the Railway Express Agency. The show will be held in the south corridor of the Thirtieth Street station of the Pennsylvania in Philadelphia, on September 18 and 19, 1936. In addition to the co-operation of the Garden Club Federation of Pennsylvania and its 70 affiliated clubs, the show will be sponsored by the Pennsylvania, the Reading and all other railroads having general or division offices in Philadelphia. It is expected that upwards of 50,000 persons will view this exhibition. In the general section of the show anyone may participate in the 66 classes which have been provided, while in the railroad section the entries may be made only by employees of railroads and the Railway Express Agency or members of their families.

This is perhaps the first time that a flower show of this magnitude has ever been staged in a railroad station and indicates the growing interest that railroad men are taking in horticultural subjects. Information and catalogs concerning the exhibition may be obtained from The Pennsylvania Horticultural Society, 1600 Arch Street, Philadelphia, Pa.

J. V. HARE
Secretary, Reading Company

Cost of a Job

To produce a railroad job costs the average railroad about $25,000 for each employee, according to the Norfolk & Western magazine. Three things are required to make the job. The railway plant, such as tracks, stations, bridges, shops, rolling stock; a stock of fuel, materials and supplies, and money in the bank as working capital. It takes about $3,000 per year per job to operate the railway as a going concern. Of this sum, approximately half goes to the employee in wages, $500 in purchases, $220 in taxes and $500 for interest on money invested, thus leaving less than $150 for dividends and reserve fund.

Northernmost Railway Bridge

W. L. Kinsell, superintendent of motive power of the Alaska railroad, with headquarters at Anchorage, Alaska, takes exception to the statement in this department last July that the bridge spanning Dead Horse Gulch is the most northerly railway bridge in the world. This bridge, Mr. Kinsell states, is south of 60 deg. north latitude, whereas the Tanana river bridge, shown in the accompanying illustration, is 64.5 deg. north, or just south of the Arctic Circle. This is claimed to be the second longest single span bridge, being 700 ft. long between the centers of the pin supports. Mr. Kinsell also supplies a photo for the cantilever bridge shown, which is across Hurricane Gulch at 60 deg. north latitude and reaches a height of nearly 300 ft. above the water.

The World's Most Northerly Railway Bridges on the Alaska

Communications and Books . . .

Railroad Museum

MADISON, NEW JERSEY

TO THE EDITOR:

Franklin Snow's letter regarding a national railroad museum, which appeared in the Railway Age of June 20, 1936, is both interesting and timely.

I agree with him that it is high time that all of the railroads of this country took steps to preserve their historical material, both equipment and documentary, before it is too late. The railroads made history in the United States, but have made little effort to preserve their own history, which is regrettable.

For the benefit of Mr. Snow, and others who may not be familiar with it, the museum of the Railway & Locomotive Historical Society, Inc., located in the Baker Library of the Harvard Business School, in Boston, Mass., houses a splendid collection of railroad memorabilia, which is not only carefully preserved, but properly exhibited. The New England railroads have sent much historical material, which will be available to future generations. Anyone interested in the history and development of railroading should plan to visit the Baker Library when in Boston.

While agreeing with Mr. Snow in principle, I differ slightly in the proper safeguarding of railroad material. While a central museum in Washington would be splendid, I feel that regional smaller museums would be more to the point. Many people could visit a museum in Chicago, who would be unable to reach Washington, etc. Why not have a number of such museums, and send a certain percentage of the material to Washington?

For a number of years I have collected such material, and have found that the owners of interesting items—often old railroad men—are willing to donate them, if they will be preserved in a museum in the vicinity of the railroad from which they originated. You cannot expect a man in San Francisco to enthuse very much over a museum in Boston or even Washington. We recognized that fact in the Railway & Locomotive Historical Society by developing local chapters, which are to work for the preservation and proper exhibition of railroad material in their own districts.

There are so many things to preserve, and they are so wrapped up in local history that it would be a mistake to take them far from their point of origin. My idea would be to have such museums in Boston, New York, Washington, Atlanta, Cincinnati, Cleveland, Chicago, St. Louis, Kansas City, Dallas, Minneapolis or St. Paul, Omaha, Denver, Salt Lake City, Los Angeles, San Francisco, and Seattle. Naturally, it would not be possible to open or establish them all at once, but it would be something to work for.

Pending establishing of suitable museums, if the railroads of this country, will have the vision to collect and preserve all historical material they can find, they will be doing something for which posterity will be very grateful.

T. T. TABER

New Books

Locomotives. By A. M. Bell. Published by Virtue and Company, Ltd., 19-21 Thavies Inn, Holborn Circus, London, England. 424 pages, 9 in. by 11 in., 2 volumes, cloth binding. Price 37s. 6d.

In these books (second edition) the author takes up the subjects of steam locomotive construction, maintenance and operation. After this, in a briefer manner, sections are included on electric, internal-combustion and other forms of motive power. Both volumes are well illustrated by line drawings and half-tones. Several are on large folded sheets and a number are printed in colors. The frontispiece, on a sheet 11 in. by 19 in., shows a phantom sectional illustration of the "Lord Nelson," a four-cylinder 4-6-0 express locomotive of the Southern Railway (Great Britain) on which 260 parts are numbered and named.

Volume I is devoted mainly to matters of design and construction of detail parts, as indicated by the nine chapter headings which are as follows: general description, boiler, superheating, cylinders and valves, framing and wheels, lubrication, tenders, continuous brakes, feedwater. In Volume II the subjects are: repairs, maintenance, combustion and fuel, running faults and failures, shop arrangements, enginemen, special types of steam locomotives, internal-combustion and electric types, modern types of locomotives. Among the special types illustrated and described are turbine locomotives, Beyer-Garratt articulated, Franco articulated and condensing locomotives. The modern locomotives chosen are those on British roads or those built by British companies for export.

While these books do not deal with American locomotives or with shop practices in this country they contain much of general information, particularly to younger men. An excellent index is

Automotive Money-Saving Facts, by J. F. Winchester. 417 pages, 9 in. by 5¾ in. Illustrated. Bound in cloth. Published by the Traffic Publishing Company, New York. Price $3.

Officers of railway motor transport affiliates will undoubtedly find much of value in this volume of practical information, designed, the author tells highway fleet operators, to "help you to further survive the onslaughts of the depression period, Interstate Commerce Commission regulative restrictions, state laws and higher commodity prices." Mr. Winchester is manager of the Standard Oil Company of New Jersey's general automotive department and is actively identified with various automotive organizations, including the American Trucking Associations' National Safety Committee, of which he is chairman and treasurer.

How to Protect Business Ideas, by William H. Leahy. 157 pages, 8½ in. by 5½ in. Bound in cloth. Published by Harper & Brothers, New York. Price $2.50.

This book is designed to be, for corporations and individuals, "a reliable guide to forestall legal difficulties, litigations and infringements." In addition to the brief foreword by Isaac W. Digges, general counsel, Association of National Advertisers, it includes seven chapters discussing in turn: Idea Protection, Trade-Marks, Prints and Labels, Patents, Design Patents, Copyrights; and Evidences of Priority. The author is presented by the publishers as one "unusually well-qualified to point the way to a ground of common understanding between the buyer and seller of ideas"—each year he reviews "an average of more than two thousand ideas and suggestions dealing with machines, formulae, processes, designs, advertising and promotional plans of the Dennison Manufacturing Company, of which he is general counsel."

Specifications for Design, Construction, Alteration and Repair of Bridges by Fusion Welding, prepared under the auspices of the American Welding Society. 6 in. by 9 in., 66 pages, illustrated. Bound in cardboard. Published by the society, 33 West Thirty-ninth street, New York. Price, $1.

The appearance of this treatise marks the beginning of a new chapter in the history of fusion welding in America. It demonstrates that the advance of the art in this field has arrived at a stage that permits of definite agreement concerning fundamental principles of design and practices by a committee of engineers representing the leading interests in this field, including four railway bridge engineers of whom P. G. Lang, Jr., of the Baltimore & Ohio, served as chairman. The book represents the results of two years of intensive work that embraced a study of the relevant literature of foreign countries as well as the United States, in addition to the investigation of current practice and available test data.

While a large part of the text is in the form of mandatory clauses, the committee has seen fit to present its views in a foreword on the limitations of the process and the responsibilities imposed on those who apply it, as well as a discussion of unit stresses that serves as a basis for the mandatory clauses relating to design. In addition to design, the specifications cover equipment, materials and workmanship, the technic of arc and gas welding, and the testing of welding work and the qualifications of welders. The sections on definitions and symbols should go a long way to bring about greater uniformity in the special terminology of this new art.

NEWS

Parade of the Years

One of the outstanding features of the Great Lakes Exposition at Cleveland, Ohio, which opened Saturday noon, June 27, is the Parade of the Years, tracing transportation in its various developments in this country from the very beginning up to the present time. This striking pageant was written and produced by Edward Hungerford and is an elaboration of the Wings of a Century, which was shown at the Chicago Exposition in 1933 and 1934. It has been improved and considerable additions have been made to include a Cleveland atmosphere.

Newton D. Baker of Cleveland, in introducing Mr. Hungerford just before the opening of the first performance on Saturday evening, said that, "No country has been so much the creature of transportation as America." The signal for opening the pageant was given by Henry Ford from his home in Dearborn, Mich. Mr. Ford has shown a keen interest in the project and loaned considerable equipment from his museum at Dearborn, including the Sam Hill locomotive.

C. H. Hogan, manager of the department of shop labor, New York Central Railroad, who drove the 999 on its famous record run from New York to Buffalo 40 years ago, was present at the premiere and took the throttle of the 999 when it appeared on the scene. Among the guests of honor was President F. E. Williamson of the New York Central.

The amphitheatre in which the pageant is shown is much larger than the one at the Chicago exposition. As in the Wings of a Century, Mr. Hungerford has had the co-operation of a considerable number of railroads and other interested organizations, by way of the loan of historical and modern equipment.

The Great Lakes Exposition is commemorative of the hundredth birthday of the city of Cleveland. It covers a space of 150 acres on the shore of the lake, within a few blocks of the center of the downtown business district. Naturally it reflects the industrial and business interests in the Great Lakes section, one of the most interesting exhibits being the Romance of Iron and Steel, dramatizing the story of the development of this basic industry from its very beginnings. Other industries and the public utilities have elaborate exhibits. There is also an unusual variety of entertainment features.

R.C.C. Has Returned 51 Per Cent

The Railroad Credit Corporation on June 30 made its twenty-ninth liquidating distribution to participating carriers, amounting to $735,881, or 1 per cent of the contributed funds. Of this amount $101,616 was paid in cash and $334,265 was credited on carriers' indebtedness to the corporation. This brings the total amount distributed to 51 per cent of the fund or $37,529,916. Of this total $17,918,732 has been returned in cash and $19,611,184 in credits.

Burlington and U.P. Reduce Time of Denver Trains

The Union Pacific and the Chicago, Burlington & Quincy, on July 12, will reduce the eastbound running times of their Denver-Chicago streamlined trains 10 min., thereby placing these trains each on a schedule of 15 hr. 50 min. eastbound and 16 hr. westbound. The Burlington's Advance Zephyr will leave Denver, Colo., at 4 p.m. (mountain time) and will arrive in Chicago at 8:50 a.m. (central time), while the Union Pacific's Streamliner, City of Denver, will leave Denver at 4:45 p.m. (mountain time) and will arrive in Chicago at 9:35 a.m. (central time). At present, these trains leave Denver at 4 p.m. Under these new schedules, the eastbound Streamliner, City of Denver, will average 66.2 miles per hour for the 1,048 miles, compared with 65.5 miles per hour at present, while the average speed of the Advance Zephyr will be 65.3 miles per hour for the 1,034 miles, compared with 64.6 miles per hour now made.

Milwaukee Opposes Joint Motor Acquisition

Asserting that the proposal of the Union Pacific, the Chicago, Burlington & Quincy, and the Chicago & North Western to acquire the Union Transfer Company and extend its trucking operations is not in the public interest, the trustees of the Chicago, Milwaukee, St. Paul & Pacific have filed with the Interstate Commerce Commission a protest asking it to deny the application. One of the points made is that there is no authority in the law for the acquisition of a trucking company jointly by several lines. The application had proposed a plan by which any other railroads interested might participate in the acquisition and operation of the trucking company in co-ordination with the rail lines. However, "what is proffered, so far as the Milwaukee road's interests are concerned," the protest says, "is therefore little more than an arrangement by which it would contribute to the capital costs, operation and transportation costs, bear its proportion of taxes, of depreciation and of losses, if any, of a highway competitor. From an economic viewpoint this does not make sense."

C. P. R. Golden Anniversary

Before a large crowd and to the strains of the British National Anthem, a steel train was sent on its way out of Windsor Station, Montreal, to Vancouver on the night of June 28, 50 years to the day after the departure of the Canadian Pacific's first trans-continental train from Montreal.

Pulled by a gaily-decorated locomotive bearing the scroll, "From Sea to Sea," the golden anniversary train was cheered on its way to the Pacific by crowds that lined the tracks at suburban stations along the route.

At 8.20 p.m., as Mayor Camillien Houde tolled a great brass bell and a military guard of honor sprang to attention, the engineer in his cab opened the throttle and the train got under way. It went out of the station to the playing of "God Save the King," after a ceremony that had taken place in the big concourse.

Fifty years before, at 8 p.m. on June 28, 1886, a puffing little train had pulled out of Dalhousie Station in Montreal, writing a page in Canadian history as it had chugged on its way to the Pacific Coast—the C. P. R.'s first transcontinental run.

It was a colorful ceremony in Windsor station, as 50 years of progress were being commemorated. Crowds filled the concourse long before train time, stood around the anniversary cake in the centre, listened to the speeches of officials of the road and leading citizens.

Green-tuniced officers and men of the Victoria Rifles of Canada formed the guard of honor, as men of this regiment had done 50 years ago at Dalhousie Station. Retired employees of the railway, who had witnessed the departure of the first train, were present to commemorate the golden anniversary..

Windsor Station was hung with flags and bunting. The cake, surmounted by an imperial crown, stood in the centre of the concourse, guarded by scarlet-coated men of the Royal Canadian Mounted Police. The cake was cut by D. C. Coleman, vice-president of the C. P. R., with a presentation silver knife.

To the assembled crowd a message from King Edward VIII was read aloud. It said: "I sincerely thank all those associated with the Canadian Pacific Railway Company for their loyal assurances on the occasion of the 50th anniversary of this great railway, which, ever since its inception, has played so notable a part in the development of the Dominion of Canada."

After martial music by the band of the Victoria Rifles and several addresses, the crowd moved onto the platform where the long train stood waiting to get under way. The guard of honor lined up along the

platform, and a few seconds before 8.20 p.m., Mayor Camillien Houde tolled a special bell and the train was sent on its way to the coast.

The engine pulling the train was one of the "2800" class, the largest in the Canadian Pacific service.

From England came a message from Sir Edward Beatty, president of the company, who is now in London.

Hon. Marguerite Shaughnessy, daughter of the late Lord Shaughnessy, third president of the C. P. R., attended the celebrations, and addressed the guests. In brief remarks, comparisons were made by William Cutnert, retired foreman at Chalk river, who oiled one side of the first train at Chalk river 50 years ago, and who came to Montreal to take part in the ceremony.

I.C.C. Authorizes Drought-Relief Rates on Livestock

On application of western railroads the Interstate Commerce Commission, acting through Commissioner Aitchison, has authorized temporary reduced drought-relief rates for the transportation of livestock from points in the drought-stricken areas in Montana, North Dakota, South Dakota, and Wyoming to available feeding points in Colorado, Iowa, Minnesota, Nebraska, and South Dakota.

Carmalt Chairman of Mediation Board

James W. Carmalt has been designated to act as chairman of the National Mediation Board for the fiscal year beginning July 1, succeeding W. M. Leiserson.

China Inquiring for Railway Construction Engineers

Preliminary to commencing the construction of about 1,500 miles of new railways in the mountainous district of southwestern China, the Chinese government is inquiring for qualified engineers to direct the various phases of the construction work. The men selected for this work, in addition to possessing the necessary experience and knowledge, must be in good health, this being considered one of the important factors governing the selection of applicants, and must be of sound character and such temperament as to be capable of co-operating with Chinese engineering associates. No limit is placed on age, and the ability to speak the Chinese language is not a necessary qualification as the engineers chosen will work among English-speaking Chinese engineers.

The engineers to be engaged include a bridge foundation engineer, who must be widely experienced in this type of work, and who must be able to design as well as to supervise the construction of difficult bridge foundations; a tunnel engineer who must be experienced in the construction of tunnels up to three miles in length through various kinds of rock and soil; a railroad engineer familiar with the design and operation of yards; and a mechanical engineer experienced in the design, assembling and repair of heavy railroad construction equipment. The bridge foundation engineer will be asked to bring with him one or two assistants who must have a thorough knowledge of construction equipment and plants.

Some of the principal conditions attached to these positions are as follows: (1) The term of the contracts will be for a period of two years, at the end of which the contracts may be renewed upon mutual agreement; (2) applicants must submit full details of past experience and the minimum salary acceptable in United States dollars; (3) salaries will be paid in United States dollars plus an allowance for living expenses for each man of 400 Chinese dollars monthly; (4) traveling expenses to and from China will be paid by the Chinese government; (5) the government of China or the engineer can at any time terminate the agreement by giving three months' notice of the intention to do so; (6) during the time that the engineers are in China they will pay their own expenses for board and lodging, but their traveling expenses while on duty will be borne by the government; (7) on the arrival of the engineers in China a contract based on these principal terms will be signed.

Canadian Roads in May

The Canadian Pacific reported for May a net of $1,450,289, as compared with $1,143,913 for May of last year, an increase of $306,375. Gross for May at $11,222,507 showed an increase of $1,308,569 over last year, while operating expenses at $9,772,218 showed an increase of $1,002,193.

For the first five months of this year C. P. R. net totaled $5,615,450, as compared with $4,658,206 for the same period of last year, an increase of $957,244. Gross earnings for the five-month period at $51,086,736 showed an increase of $4,747,983, while operating expenses at $45,471,285 were $3,790,739 above expenses for the same period of last year.

The Canadian National reported an increase of $279,023 in net for May, as compared with May, 1935. Operating revenues were $15,400,121, as compared with $14,045,380 last year, an increase of $1,354,740. Operating expenses, which in May, 1935, were $13,390,853, increased by $1,075,717. The statement shows a net revenue for the month of $933,551.

For the five-months period ending May 31, there was an increase in operating revenues of $4,302,122 and an increase in operating expenses of $4,499,746, the net revenue of $2,465,589 being $197,624 less than last year's $2,663,221.

Meetings & Conventions

The following list gives names of secretaries, date of next or regular meetings, and places of meetings:

AIR BRAKE ASSOCIATION.—T. L. Burton, Room 3400, Empire State Bldg., New York, N. Y. Annual meeting, September 15-16, 1936, Hotel Sherman, Chicago, Ill.

ALLIED RAILWAY SUPPLY ASSOCIATION.— F. W. Venton, Crane Company, 836 S. Michigan Ave., Chicago, Ill. To meet with Air Brake Association, Car Department Officers' Association, International Railway Master Blacksmith's Association, International Railway Fuel Association, International Railway General Foremen's Association, Master Boiler Makers' Association and the Traveling Engineers' Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.— W. R. Curtis, F. T. R., M. & O. R. R., Chicago, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.— E. L. Duncan, 816 McCormick Bldg., Chicago, Ill. Annual meeting, October 27-29, 1936, New Orleans, La.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York, N. Y.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—F. O. Whiteman, Union Station, St. Louis, Mo. Annual meeting, 1937, Chicago, Ill.

AMERICAN ASSOCIATION OF RAILWAY ADVERTISING AGENTS.—E. A. Abbott, Poole Bros., Inc., 85 W. Harrison St., Chicago, Ill. Annual meeting, January 15-16, 1937.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger, C. I. & L. Ry., 836 S. Federal St., Chicago, Ill. Annual meeting October 5-8, 1936, Royal York Hotel, Toronto, Ontario.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, 319 N. Waller Ave., Chicago, Ill. Annual meeting, October 20-22, 1936, Hotel Stevens, Chicago, Ill. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY CAR INSTITUTE.—W. C. Tabbert, 19 Rector St., New York, N. Y.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION. —R. G. Buford, Asst. Mgr., Industrial Development Dept. M-K-T R. R., Dallas, Tex. Next meeting October 8-9, 1936, Dearborn, Mich.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.— Works in co-operation with the Association of American Railroads, Division IV.— E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 16-18, 1937, Palmer House, Chicago, Ill.

AMERICAN RAILWAY MAGAZINE EDITORS' ASSOCIATION.—M. Fenaja, Missouri Pacific Lines Magazine, Missouri Pacific Lines Bldg., St. Louis, Mo.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C. M., St. P. & P. R. R., 11402 Calumet Ave., Chicago, Ill. Annual meeting, September 17-18, 1936, Hotel Sherman, Chicago, Ill.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.— R. E. Schindler, Union Trust Bldg., Washington, D. C. Annual meeting, August 24-25, 1936, Brown Palace Hotel, Denver, Col.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.— C. E. Davies, 29 W. 39th St., New York, N. Y.

Railroad Division.—Marion B. Richardson, 192 E. Cedar St., Livingston, N. J.

AMERICAN TRANSIT ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York, N. Y. Annual meeting, September 21-24, 1936, The Greenbrier Hotel, White Sulphur Springs, W. Va.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1427 Eye St., N. W., Washington, D. C. Annual meeting, January 26-28, 1937, New Orleans, La.

ASSOCIATION OF AMERICAN RAILROADS.—H. J. Forster, Transportation Bldg., Washington, D. C.

Operations and Maintenance Department.— J. M. Symes, Vice-President, Transportation Bldg., Washington, D. C.

Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Freight Station Section.—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Protective Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Safety Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Telegraph and Telephone Section.— W. A. Fairbanks, 30 Vesey St., New York, N. Y. Next meeting, October 6-8, 1936, Mayflower Hotel, Washington, D. C.

Division II.—Transportation.—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.

Division IV.—Engineering.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 16-18, 1937, Palmer House, Chicago, Ill.

Construction and Maintenance Section. —E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Annual meeting March 16-18, 1937, Palmer House, Chicago, Ill.

Electrical Section.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill.

Signal Section.—R. H. C. Balliet, 30 Vesey St., New York, N. Y.

Division V.—Mechanical.—V. R. Hawthorne, 59 E. Van Buren St., Chicago, Ill.

Division VI.—Purchases and Stores.— W. J. Farrell, 30 Vesey St., New York, N. Y. Annual meeting, July 9-10, 1936, Palmer House, Chicago, Ill.

Division VII. — Freight Claims. — Lewis Pilcher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, 1937, Toronto, Ontario, Canada.

Division VIII. — Motor Transport. —

George M. Campbell, Transportation Bldg., Washington, D. C.
Car-Service Division.—C. A. Buch, Transportation Bldg., Washington, D. C.
Traffic Department.—A. F. Cleveland, Vice-President, Transportation Bldg., Washington, D. C.
Finance, Accounting, Taxation and Valuation Department.—E. H. Bunnell, Vice-President, Transportation Bldg., Washington, D. C.
Accounting Division.—E. R. Ford, Transportation Bldg., Washington, D. C.
Treasury Division.—E. R. Ford, Transportation Bldg., Washington, D. C.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—F. L. Johnson, Chief Clerk and Claim Agent, General Claims Dept., Alton R. R., 340 W. Harrison St., Chicago, Ill. Annual meeting, May, 1937, Cincinnati, Ohio.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., 1519 Daily News Bldg., 400 W. Madison St., Chicago, Ill. Annual meeting, October 27-29, 1936, Hotel Sherman, Chicago, Ill. Exhibit by Railway Electrical Supply Manufacturers' Association.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—W. S. Carlisle National Lead Company, 900 W. 18th St., Chicago, Ill. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 2271 Wilson Ave., N. D. G., Montreal, Que. Regular meetings, second Monday of each month, except June, July and August, Windsor Hotel, Montreal, Que.

CAR DEPARTMENT OFFICERS' ASSOCIATION.—A. S. Sternberg, M. C. B. Belt Ry. of Chicago, 7926 S. Morgan St., Chicago, Ill. Annual meeting, September 15-16, 1936, Hotel Sherman, Chicago, Ill.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, 2514 W. 55th St., Chicago, Ill. Regular meetings, second Monday of each month, except June, July and August, La Salle Hotel, Chicago, Ill.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, Room 299, 610 S. Main St., Los Angeles, Cal. Club not active at present.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—E. G. Bishop, Illinois Central System, East St. Louis, Ill. Regular meetings, third Tuesday of each month except June, July and August, Hotel Statler, St. Louis, Mo.

CENTRAL RAILWAY CLUB OF BUFFALO.—Mrs. M. D. Reed, 1817 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, second Thursday of each month except June, July and August, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 2920 Utopia Place, Hyde Park, Cincinnati, Ohio. Operation suspended indefinitely.

CLEVELAND RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings temporarily suspended.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—T. D. Smith, 1660 Old Colony Bldg., Chicago, Ill. Annual meeting, September 17-18, 1936, Hotel Sherman, Chicago, Ill.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha St., Winona, Minn. Annual meeting September 15-16, 1936, Hotel Sherman, Chicago, Ill.

INTERNATIONAL RAILWAY MASTERS BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Annual meeting, September 17-18, 1936, Hotel Sherman, Chicago, Ill.

MASTER BOILER MAKERS' ASSOCIATION.—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y. Annual meeting, September 16-17, 1936, Hotel Sherman, Chicago, Ill.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—Clyde S. Bailey, 810 18th St., N. W., Washington, D. C. Annual meeting, November 10-13, 1936, Atlantic City, N. J.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. H. White (Pres. and Sec'y), Room 1826, 208 S. La Salle St., Chicago, Ill. Exhibit at A. R. E. A. Convention, March, 16-18, 1937, The Coliseum, Chicago, Ill.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, second Tuesday of each month, except June, July, August and September, Copley-Plaza, Boston Mass.

NEW YORK RAILROAD CLUB.—D. W. Pye, 30 Church St., New York, N. Y. Regular meetings, third Friday of each month, except June, July and August, 29 W. 39th St., New York, N. Y.

PACIFIC RAILWAY CLUB.—William S. Wollner, P. O. Box 3275, San Francisco, Cal. Regular meetings, second Thursday of each month, alternately at San Francisco and Oakland, excepting June at Los Angeles and October at Sacramento.

RAILWAY BUSINESS ASSOCIATION.—P. H. Middleton (Treas. and Asst. Sec'y), First National Bank Bldg., Chicago, Ill.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 1941 Oliver Bldg., Pittsburgh, Pa. Regular meetings, fourth Thursday of each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. McC. Price, Allen-Bradley Company, 600 W. Jackson Blvd., Chicago, Ill. Meets with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—P. A. Bissell, 40 Broad St., Boston, Mass. Annual meeting, October 20-21, 1936, Congress Hotel, Chicago, Ill.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1941 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division, Purchases and Stores Division, and Motor Transport Division, Association of American Railroads.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with Telegraph and Telephone Section of A. A. R., Division I.

RAILWAY TIE ASSOCIATION.—I. C. Rowe, 2091 Railway Exchange Bldg., St. Louis, Mo.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Annual meeting, September 15-17, 1936, Hotel Stevens, Chicago, Ill.

SIGNAL APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with A. A. R., Signal Section.

SOCIETY OF OFFICERS, UNITED ASSOCIATIONS OF RAILROAD VETERANS.—M. W. Jones, Baltimore & Ohio, Mt. Royal Station, Baltimore, Md. Annual meeting, October 3-4, 1936, Hotel Fort Shelby, Detroit, Mich.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, 4 Hunter St., S. E., Atlanta, Ga. Regular meetings, third Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta, Ga.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & C. R. R., Atlanta, Ga.

TOOL FOREMEN SUPPLIERS' ASSOCIATION.—E. E. Caswell, Union Twist Drill Co., 11 S. Clinton St., Chicago, Ill. Meets with American Railway Tool Foremen's Association.

TORONTO RAILWAY CLUB.—R. H. Burgess, P. O. Box 8, Terminal "A," Toronto, Ont. Regular meetings, fourth Monday of each month, except June, July and August, Royal York Hotel, Toronto, Ont.

TRACK SUPPLY ASSOCIATION.—D. J. Higgins, Gardner-Denver Company, 332 S. Michigan Ave., Chicago, Ill. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—Miss E. Earl, acting secretary, 10213 Hampden Avenue, Cleveland, Ohio. Annual meeting September 15-16, 1936, Hotel Sherman, Chicago, Ill.

WESTERN RAILWAY CLUB.—C. L. Emerson, C. M. St. P. & P., Chicago, Ill. Regular meetings third Monday of each month, except June, July, August and September, Hotel Sherman, Chicago, Ill.

Supply Trade

The General Refractories Company, Philadelphia, Pa., has moved its general offices into new quarters in the Real Estate Trust building, at Broad and Market streets, Philadelphia.

Alex Chapman, district sales agent of the **Rail Joint Company,** at Chicago, has been appointed western sales manager with the same headquarters. **R. R. Seward,** district sales agent, at New York, has been appointed eastern sales manager with the same headquarters.

Paul D. Mallay has been appointed manager of the Insulation Division, eastern district, of the **Gustin-Bacon Manufacturing Company,** Kansas City, Mo. Mr. Mallay was for many years chief engineer of the Transportation Department of the Johns-Manville Sales Corporation and subsequently vice-president of the Geo. A. Nicol Corporation. The eastern headquarters of the Gustin-Bacon Company are at 401 North Broad street, Philadelphia, Pa.

OBITUARY

Horace A. Crocker, retired mechanical expert of the Westinghouse Air Brake Company, died May 27. Mr. Crocker was born in Indiana and went to California in 1882 to enter the employ of the Southern Pacific at San Francisco. After 21 years' service as a mechanic, air brake repairman and later air brake inspector, he became associated with the Westinghouse Air Brake Company as inspector at Oakland, in 1903. He was transferred to Los Angeles as representative of the Westinghouse Air Brake Company and Westinghouse Traction Brake Company, which position he held until his retirement in 1933.

TRADE PUBLICATIONS

FOAM PREVENTION.—Under the title "Scientific Prevention of Foaming," an eight-page bulletin, No. 360, has recently been issued by the Electro-Chemical Engineering Corporation, subsidiary of the Dearborn Chemical Company, 310 South Michigan Avenue, Chicago. This bulletin describes in detail the method of installation and operation of the Signal Foam-tively controlling "invisible high water" or Meter, a device designed to permit effec-light water in a locomotive boiler, and thus prevent this water from reaching a level at which it will pass into the superheater units and the locomotive valves and cylinders with attendant ill effects. Eleven specific advantages of the use of this device are listed in the bulletin, varying from substantially reduced blow-off requirements to improved operation of the throttle and cut-off which produces the highest superheat and maximum cylinder horsepower. A clear-cut drawing on the inside pages of the bulletin shows the location of the various parts of the Signal Foam-meter installation, as well as the Electromatic blow-off steam separator system.

JOURNAL BEARING DAMAGE.—The subject of journal bearing damage, its effects and remedy, is covered in an eight-page bulletin recently prepared for distribution by the Lewis Bolt & Nut Company, Minneapolis, Minn. This bulletin gives in condensed form a description of the methods followed and results secured in certain tests recently conducted in the laboratory of the Railway Service & Supply Company, Indianapolis, Ind., under the direction of K. W. Brossart of the Railway Service & Supply Company and H. W. Johnson of the Lewis Bolt & Nut Company. It is claimed in the bulletin that the tests proved conclusively that major or minor damage to the linings of plain journal bearings seriously interferes with proper lubrication and as a result tends to produce hot boxes and attendant operating difficulties and delays. Part II of the bulletin shows the favorable results secured with Macer journal bearing protectors in avoiding damage to journal bearings in transit.

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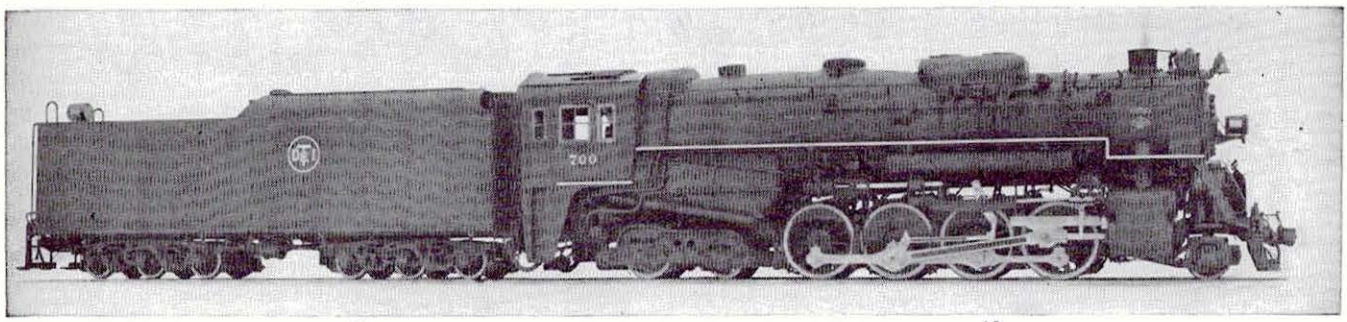
D&I



The four 2-8-4 Type heavy freight locomotives delivered in December, 1935, by Lima Locomotive Works, Inc., to the Detroit, Toledo and Ironton Railroad are proving the advantages of modern power, both as to increased earning capacity and operating economy in heavy freight transportation.

LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

LIMA
LOCOMOTIVE WORKS
INCORPORATED

Equipment and Supplies

Half Year's Equipment Orders Best Since 1930

Include 122 locomotives, 26,560 freight cars and 107 passenger-train cars

Domestic orders for 24 locomotives, 4,320 freight cars and 20 passenger-train cars were reported in June issues of the *Railway Age*. Freight car orders for the first six months of the current year are now in excess of those for the entire 12 months of any year since 1930 and the same is true of orders for steam locomotives, while the 1936 orders for passenger-train cars are in excess of those for the entire 12 months of any of the five prior years except 1934.

During the first six months of this year a total of 26,560 freight cars has been ordered as compared with 18,699 ordered throughout 1935; 24,611 in 1934; 1,685 in 1933; 1,968 in 1932; and 10,880 in 1931. In addition, there has been placed since the close of last month, as reported elsewhere in these columns, orders for 1,000 freight cars, while on July 1 inquiries for 2,375 more were outstanding and plans had been announced for the acquisition of 1,000 others.

The 24 locomotives ordered in June brought the 1936 total to date to 122, including 104 steam locomotives. Last year a total of 83 locomotives, including 28 steam was ordered. The current year's six-months total orders for all types of locomotives is exceeded by the 12-months figures of only two years out of the last five—1934, when 183 were ordered, and 1931 with 176. These latter, however, included respectively only 72 and 62 steam locomotives. Also, there have been ordered during the past six months, power units for four streamlined trains and on July 1 inquiries for 10 steam locomotives were outstanding.

The six months total of passenger-train cars ordered is 107, orders for 20 having been placed during June. This is 70 per cent in excess of the 63 passenger-train cars ordered throughout last year. In addition, five streamlined trains were ordered up to the end of June and two others of 12 cars each have been ordered since that time, as reported elsewhere in these columns. Inquiries were outstanding on July 1 for nine passenger-train cars.

Rail orders for the six months totaled 468,485 tons or 94 per cent of last year's 12 months total of 495,300 tons. Of the 1936 figure 10,000 tons were ordered last month. Details of the equipment orders will be found in an accompanying table.

Domestic Equipment Orders Reported in Issues of the Railway Age in June 1936

Locomotives

Date	Name of Company	No.	Type	Builder
June 20	Boston & Maine	3	Diesel-electric switching	Electro-Motive Corp.
June 20	Portland Terminal Co.	3	Diesel-electric switching	American Locomotive Co.
June 27	Southern Pacific	6	4-8-4	Lima Locomotive Works
		12	4-8-8-2	Baldwin Locomotive Works

Freight Cars

Date	Name of Company	No.	Type	Builder
June 13	Cornwall R. R.	20	Hopper	Bethlehem Steel Co.
June 13	Merchants Despatch, Inc.	500	Refrigerator	Merchants Despatch Trans. Co's Shops
June 27	Wheeling & Lake Erie	500	Hopper	Pullman-Standard
		500	Hopper	Ralston Steel Car Co.
June 27	Southern Pacific	250	Auto box	Mt. Vernon Car Mfg. Co.
		500	Auto box	Gen. American Trans. Co.
		500	Box	Pressed Steel Car Co.
		500	Box	Pullman-Standard
		500	Box	Bethlehem Steel Co.
		250	Box	American Car & Fdy. Co.
		200	Flat	Company Shops
		100	Gondola	Company Shops

Passenger Cars

Date	Name of Company	No.	Type	Builder
June 27	Southern Pacific	20	Baggage-horse	St. Louis Car Co.

LOCOMOTIVES

Cotton Belt Expenditures Approved

Application of the St. Louis Southwestern for authority to spend $1,933,203 for equipment, betterments and maintenance, filed in the federal court at St. Louis, Mo., on May 19, was granted in part and denied in part on June 29 by Federal Judge C. B. Davis. The court approved expenditures totaling $1,133,203, but denied without prejudice the request to purchase five locomotives at a cost of $575,000 and five air-conditioned coaches at a cost of $225,000. The Bankers Trust Company of New York as trustee under the second mortgage bonds had opposed cash expenditures for new equipment, particularly those for locomotives and automobile cars, suggesting that improvements not immediately needed might be financed through equipment trust certificates. This, it was said, would conserve cash to pay $400,000 bond interest due this month. The court, however, turned down the suggestion of the trust company and directed the trustee not to pay the interest. The purchase of $370,489 of new steel rail was approved, together with the purchase of automobile cars and other betterments and maintenance.

THE RICHMOND, FREDERICKSBURG & POTOMAC is inquiring for five locomotives of the 4-8-4 type, for delivery in the fall of this year. They are designed to have 27-in. by 30-in. cylinders, steam pressure of 275 lb., 77-in. drivers, with a total engine weight of 450,000 lb. The engine and tender to weigh 818,000 lb., the tractive effort will be 66,400 lb., and the tender capacity 20,000 gal. of water and 22 tons of coal.

FREIGHT CARS

THE CENTRAL OF GEORGIA is inquiring for 200 hopper cars of 50 tons' capacity.

THE LEHIGH & NEW ENGLAND has ordered 250 steel hopper cars of 50 tons capacity from the Bethlehem Steel Company.

THE GENERAL CHEMICAL COMPANY has ordered three tank cars of 50-tons capacity from the American Car & Foundry Company. These cars are to be lead-lined and used for carrying electrolytic acid.

THE STANDARD OIL COMPANY OF NEW JERSEY has ordered five tank cars of 12,000 gal. capacity and five two-compartment 8,000 gal. capacity tank cars from the General American Transportation Corporation. These cars are for service in Mexico.

THE NORTHERN PACIFIC has ordered 500 gondola cars from the Pressed Steel Car Company and 250 flat cars from its own shops. Inquiry for this equipment was reported in the *Railway Age* of February 22.

THE GUAYAQUIL & QUITO (Ecuador) has ordered 50 narrow-gage box cars of about 22½ tons' capacity, from the American Car & Foundry Company. The New York office of the company is at 17 Battery Place.

PASSENGER CARS

THE SOUTHERN PACIFIC has placed an order with the Pullman-Standard Car Manufacturing Company for two 12-car, streamlined trains, which will be placed in daily daytime operation on its coast line between San Francisco, Cal., and Los Angeles about January 1. The tentative schedule calls for departure from San Francisco and Los Angeles at 8 a.m. and arrival at destination not later than 6 p.m., the schedule being one hour faster than the present fastest train time between these cities. The trains will be named the Daylight. The trains will be powered with high-speed, streamlined steam locomotives and the trains complete with reserve motive power will cost approximately $2,000,000. Each train will include chair cars, a parlor car, a parlor-observation car, a dining car and a tavern car. They will be air-conditioned throughout. The tavern car, which will be a separate unit, will be of unique and original design, with lunch counter facilities at one end and lounge space, equipped to serve refreshments and

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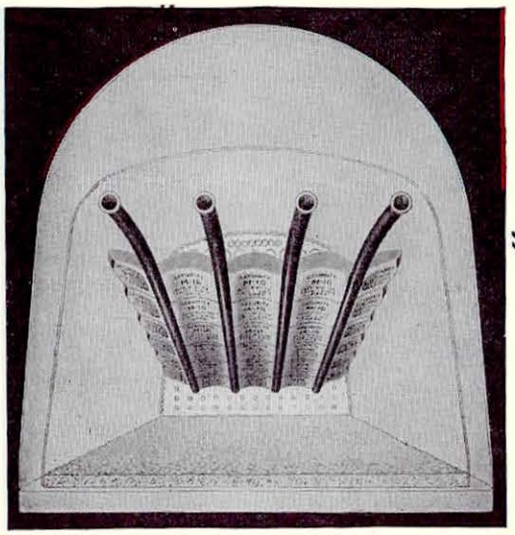
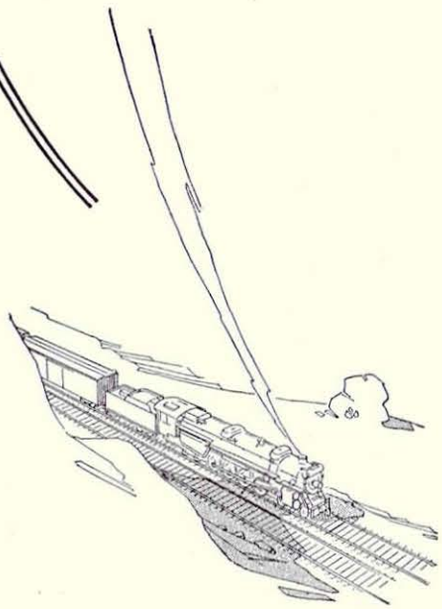


It pays
TO CONCENTRATE
WHERE RESULTS ARE
LARGE

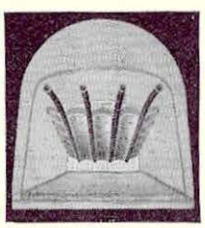


Concentration on fuel conservation is the one place where the reward is great. » » » Make sure you get the full coal savings the Security Arch gives by maintaining a complete arch at all times.

There's More to SECURITY ARCHES
Than Just Brick

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists



AMERICAN ARCH CO.
INCORPORATED

Locomotive Combustion Specialists » » »

beverages, at the other. Each train will have a capacity of 465 passengers.

IRON & STEEL

THE CHESAPEAKE & OHIO has placed orders for 20,000 tons of rail, divided as follows: Carnegie-Illinois Steel Corporation, 11,200 tons; Inland Steel Company, 6,800 tons; and Bethlehem Steel Company, 2,000 tons.

NEW YORK CENTRAL.—A contract for 4,700 tons of steel has been let to the American Bridge Company, to be used on the West Side Improvements of this road from 111th street to 121st street, New York City. James Stewart & Company are the contractors.

Construction

GRAND TRUNK WESTERN.—An extensive dock and warehouse construction project is now being carried out on the property of this company in Detroit, Mich., where it fronts on the Detroit River at the Brush Street yard. The project involves the construction of 800 lin. ft. of steel sheet piling dock, using Carnegie "Z" piling section with concrete dock surfacing, and a warehouse, 700 ft. long by 100 ft. wide consisting of structural steel framework on concrete foundation, with sand-lime block exterior walls, steel sash and a steel roof deck. Two tracks will extend the full length of the building and will be depressed so that the car deck level will correspond with the floor level of the warehouse. The project will cost in excess of $250,000. The work is being performed under contract by Hamer Bros., Inc. The building superstructure is being constructed by the Michigan Dock Corporation, which is the lessee and will operate the terminal. The contractors for this portion of the work are the Truscon Steel Company, Youngtown, Ohio, and the O. W. Burke Company.

LEHIGH VALLEY.—A contract has been given to I. M. Ludington Sons, Inc., Rochester, N. Y., for grade crossing elimination work at Alpine, N. Y., to cost about $75,000 and a contract has also been given to the Faircroft Engineering Corporation, Brooklyn, N. Y., for grade crossing elimination work at Kendaia, N. Y., to cost about $97,000.

PENNSYLVANIA.—A contract has been awarded to the Ross and White Company, Chicago, for a fireproof, automatic, electric locomotive coaler having a direct-coaling capacity of 80 tons per hour for installation at the enginehouse at Cambridge, Ohio.

STATEN ISLAND RAPID TRANSIT RAILWAY COMPANY.—This Baltimore & Ohio subsidiary will open bids at 11.00 a.m. Eastern Standard Time, July 6, at the chief engineer's office, Baltimore, Md., for the elimination of the grade crossing at John street, Elm Park, Staten Island, New York. The estimated cost of the work is $100,000.

Financial

ATCHISON, TOPEKA & SANTA FE.—*Dividend.*—Directors of this road on June 30 voted a $2 dividend on the common stock payable September 1 to stockholders of record July 31. The last previous payment was also $2 in September, 1935.

CHESAPEAKE & OHIO.—*Bonds.*—An application has been filed with the Interstate Commerce Commission for authority to issue and sell $29,500,000 of refunding and improvement mortgage 3½ per cent bonds, Series E, for the purpose of retiring and refunding $24,784,000 of 4½ per cent bonds maturing in 1993 and $4,716,000 of 4½ per cent bonds now in the treasury. It is proposed to call the $24,884,000 of bonds on October 1 at 110. The interest saving from the refunding operation is estimated at $19,055,465 over the period.

CHICAGO GREAT WESTERN.—*Equipment Trust.*—This company has applied to the Reconstruction Finance Corporation for a loan of $150,000 to be effected by the sale of 4 per cent equipment trust certificates for the purchase of 100 all-steel flat cars.

MAINE CENTRAL.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Oquossoc, Maine, to Kennebago, 10.82 miles.

MINNEAPOLIS & ST. LOUIS.—*Dismemberment Hearings.*—At the hearing before the Interstate Commerce Commission on the dismemberment of the Minneapolis & St. Louis, being held in Minneapolis, Minn., George A. Anderson, controller of the railroad, testified that the M. & St. L. may expect a net income of $800,000 on the basis of present gains in business over last year, his testimony being designed to show that the road can be operated successfully as a unit and that there is no need for a split-up to insure salvaging some of the service and employment it now provides. Mr. Anderson said that on the basis of three months' actual figures, he had estimated the road would have $650,227 available for interest after all charges, but that business for the first five months had run 20 per cent ahead of the corresponding period last year. The gains in net income were made after the road was forced to spend $110,000 for snow and ice removal, compared with $19,000 in 1935. He testified that the equipment of the road had a book value of $9,728,421, calculating from this the depreciated value and adding $539,309 in materials and supplies, he reached a total of $5,222,915, or only $1,978,085 less than Associated would pay for the entire system, including the equipment, buildings and rails. Commenting further on the business gains, Mr. Anderson said May revenues had exceeded May, 1935, by $150,000, and on the basis of incomplete reports, June will go ahead of June of last year by $125,000.

Arguments of the opponents to the sale was supported by the testimony of five Minneapolis business men who declared the M. & St. L. had always provided good service and its breakup, through dismemberment, would cut off Minneapolis from important markets. They said unfavorable rates had narrowed the city's market area and that breakup of the important north-south route which the M. & St. L. furnishes would add to the advantage which Chicago has been gaining in the Minneapolis trade territory. T. E. Hawks, traffic manager of the Deere & Webber Company, said the road should be retained. R. M. Andreas, traffic manager of the B. F. Nelson Manufacturing Company, said any loss of employment would cost his company business. W. A. Morse, treasurer of the Security Warehouse Company, testified that branch line service to communities in southern Minnesota, northern Iowa and western Minnesota would not be as favorable. C. G. Gohlke, vice-president of the Kedney Warehouse Company, praised the switching service given by the M. & St. L. and said its split-up would improve the advantage of the Omaha, Sioux Falls and Sioux City markets. A. W. Leslie, vice-president of the John Leslie Paper Company, said the early mail deliveries now provided by the M. & St. L. from the south and west was highly important to a wholesaler.

John W. Devins, general manager of the M. & St. L., testified in opposition to witnesses of the Associated Railways Company. He testified that at no place on the line between Minneapolis and Peoria, Ill., is it necessary for trains to run slowly because of inadequate track maintenance and poor condition of the line. Associated testimony had made a point of slow orders because of poor bridges, which Mr. Devins flatly denied. He said the road could handle 100 per cent more tonnage than at present with the main line in the same condition that it is today. He testified that the only wreck or derailment in recent years had been on a section of track used jointly with another line and maintained by the other road. He said that, with the exception of a few branches, the M. & St. L. offers freight and passenger service on all of its trackage, adding that more trains were being operated than are shown in timetables.

George Hand, president of the Associated Railways, took the stand briefly to testify as to the joint operating rights the M. & St. L. and the Northern Pacific have on trackage in Minneapolis and St. Paul. He said the Associated Railways would relinquish the rights the M. & St. L. had on Northern Pacific trackage in St. Paul, but would continue the rights the Northern Pacific has on M. & St. L. trackage.

W. F. Lewis, general chairman of the M. & St. L. division of the Brotherhood of Locomotive Firemen and Enginemen, said that bonds should be required of the members of the Associated Railways Company, for there are no guaranties in the purchase application, nor have any been given in evidence presented at these hearings which in any way protect M. & St. L. employees. Mr. Lewis testified that his computation showed that of 425 engine employees now on the divisions between Minneapolis and Peoria, only 366 will retain their jobs. He declared the condition

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The Superheater

AS A FACTOR IN LOCOMOTIVE DESIGN

Each of the following features is being discussed in this series of advertisements.

Maximum Ton Miles per Hour

•

Boiler Capacity and Tractive Effort

•

Heating Surface and Boiler Capacity

•

Heating Surface and Boiler Efficiency

•

Minimum Draft Loss and Low Back Pressure

•

High Sustained Superheat

•

Higher Superheat and Minimum Steam Consumption

•

Greater Sustained Capacity

•

Reduced Fuel and Water Consumption per Unit of Work Done

•

Total Fuel Consumption of American Railroads

•

Reduced Cost of Locomotive Horsepower

For High Efficiencies Use Elesco Type "E" Superheaters

✓

✓

2

Boiler Capacity and Tractive Effort

High sustained tractive effort at high speeds requires maximum boiler capacity within clearance limits and minimum steam consumption of the engines.

Previous to the general introduction of the type "E" superheater, the relationship between boiler and cylinder capacity was such that the maximum power of the locomotive was reached at about 1000 ft. piston speed. This relationship was generally accepted as the basis for design and generally holds true for locomotives with type "A" superheaters.

Locomotives equipped with type "E" superheaters develop maximum capacity at piston speeds up to 1800 ft. per minute, with substantial improvement in tractive effort and horsepower. This is due to the greater heating surface within the clearance limits, possible only with the type "E" superheater, which provides greater boiler efficiency and higher superheat.

THE SUPERHEATER COMPANY

Representative of American Throttle Company, Inc.

60 East 42nd Street
NEW YORK

ELESCO

Peoples Gas Building
CHICAGO

Canada: The Superheater Company, Limited, Montreal

Superheaters • Superheated Steam Pyrometers • Exhaust Steam Injectors • Feed Water Heaters • American Throttles

of the roadway was safe. Despite the most severe weather conditions in the road's history last winter, he continued, the M. & St. L. handled an extremely heavy volume of traffic immediately after the breakup in March, without any operating difficulties.

C. L. Montooth, international senior vice-president of the Order of Railway Conductors, testified that rules provided employees of one road absorbed by another would retain seniority rights in proportion to the mileage of the purchased and purchasing lines. Under this arrangement, only a few M. & St. L. workers could expect to get seniority rights.

A. L. Gardner, general chairman of the M. & St. L. division of the Order of Railroad Telegraphers, estimated that 38 per cent of the 278 railroad telegraphers on the line would be dismissed if the plan were made effective. Many more would lose their jobs in due time, he said. A. Sinclair, chairman of the M. & St. L. division of the Brotherhood of Locomotive Firemen and Enginemen, testified that the plan would harm members of that body.

On June 29, the hearing moved from Minneapolis to Ft. Dodge, Iowa. E. L. Oliver, statistician for the Brotherhood of Railway Clerks, refuted statements of John W. Barriger III., chief examiner of the Railroad division of the Reconstruction Finance Corporation, at the hearing in April. Mr. Oliver contended that in 1935, as compared with 1934, the M. & St. L. had a greater increase in traffic in manufactured products and miscellaneous carload and l. c. l. freight than any of the seven roads comprising Associated Railways. It also led in respect to the gain in the volume of lumber and other forest products moved, with an increase of 43 per cent, while in shipments of mine products it was exceeded only by the Great Northern.

In the first quarter of this year, he said, the gross operating revenue of the M. & St. L. increased $297,119 over the three months of 1935, a gain of 18.4 per cent, compared with 23.6 per cent, on the Chicago, Burlington & Quincy; 21.1 per cent on the Chicago, Milwaukee, St. Paul & Pacific; 20.4 per cent on the Minneapolis, St. Paul & Sault Ste. Marie; 17.9 per cent on the Chicago & North Western; 15.1 per cent on the Chicago, Rock Island & Pacific; 14.6 per cent on the Illinois Central; and 8.6 per cent on the Great Northern. The operating ratio of the M. & St. L., he testified, was reduced from 90.31 per cent in 1931 to 88.87 per cent in 1935, while of the seven other roads, the Soo and the Great Northern were the only ones which reduced their ratios in the five years. The ratios of the others showed increases.

Mr. Oliver, as spokesman for labor, also testified as to the hardships that would be suffered by employees who would lose their jobs. One of the most debatable issues at the hearing is employmeut. Organized labor demands that employees be protected by something more than the informal assurance given so far by Associated Railways. The employees also contend that the agreement entered into by the railways and labor in May, which provides compensation for employees who are forced out of work as a result of co-ordination, should apply to the M. & St. L. case. Associated contends that the taking over of the M. & St. L. is not a co-ordination but a sale.

PENNSYLVANIA.—*Acquisition of Trucking Companies.*—J. Edward Davey, chief of the section of finance of the Interstate Commerce Commission's Bureau of Motor Carriers, has recommended in a proposed report that the commission authorize the purchase by the Barker Motor Freight, Inc., of the property and certificates of the Barker Motor Freight Lines and the acquisition by the Pennsylvania Truck Lines, Inc., of control of the Barker Motor Freight, Inc., by purchase of its capital stock.

WHEELING & LAKE ERIE.—*Plan Adopted.*—The Jones compromise plan for settlement of the 10 year old battle between the Van Sweringen and Taplin interests over control of the Wheeling & Lake Erie was adopted at Cleveland, Ohio, on June 29, at a meeting of the road's stockholders. Only slight opposition developed at the meeting to the plan, worked out by Jesse Jones, chairman of the Reconstruction Finance Corporation. By its terms the Van Sweringen forces will retain control of the road, but will sacrifice some financial consideration through a conversion of stock. The Jones plan provides for payment of all back dividends on the seven per cent prior lien stock which already has been done; exchange of the seven per cent prior lien stock for prior lien non-callable four per cent cumulative shares; reduction in the dividend rate of preferred stock from six per cent to 5½ per cent, and made cumulative from August 1, 1936, convertible into common share for share and callable at any time at par and accrued dividends; retention of common capitalization as previously constituted; and giving each share of every class of stock one vote on all matters upon which stockholders vote.

YOSEMITE VALLEY.—*R.F.C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of $1,159,000 for which it proposes to sell to the corporation its first mortgage 4 per cent sinking fund 20-year bonds, the proceeds to be used in retiring the outstanding $2,318,000 of first mortgage 5 per cent bonds which matured on January 1, 1936.

Average Prices of Stocks and of Bonds

	June 30	Last week	Last year
Average price of 20 representative railway stocks..	48.58	48.28	33.47
Average price of 20 representative railway bonds..	79.33	80.00	75.33

Dividends Declared

Carolina, Clinchfield & Ohio.—$1.00, quarterly; Stamped Certificates, $1.25, quarterly, both payable July 20 to holders of record July 10.

Reading.—50c, quarterly, payable August 13 to holders of record July 16; First Preferred, 50c, quarterly, payable September 10 to holders of record August 20; Second Preferred, 50c, quarterly, payable October 8 to holders of record September 17.

Wheeling & Lake Erie.—7 Per Cent Prior Lien Preferred, $1.75, payable August 1 to holders of record July 31.

Atchison, Topeka & Santa Fe.—Common, $2.00, payable September 1 to holders of record July 31.

Railway Officers

EXECUTIVE

F. J. Gavin, general manager of the Eastern lines of the Great Northern, with headquarters at Duluth, Minn., has been appointed to the newly-created position of assistant to the president with headquarters at St. Paul Minn.

W. E. Maxson, assistant general manager of the Gulf, Colorado & Santa Fe, has been appointed vice-president and general manager, with headquarters as before at Galveston Tex., succeeding **F. G. Pettibone,** who has retired.

John A. Small, general manager of the Southern Pacific of Mexico, who has been appointed vice-president, with headquarters as before at Guadalajara, Jal., as noted in the *Railway Age* of June 6, was born on November 16, 1878, at Oakland, Cal. Mr. Small entered railway service in 1895 as a call boy and messenger on

John A. Small

the Southern Pacific, leaving this company two years later to become a telegrapher with the Western Union Telegraph Company. In 1899 he returned to the service of the Southern Pacific, serving as a telegrapher and clerk until 1900, when he was appointed chief clerk in the construction department. After nine years in the latter position, Mr. Small was appointed assistant to the chief engineer of the Southern Pacific of Mexico. In 1912 he was appointed superintendent of the Guadalajara division of that road, and in 1915 he was transferred to the Cananead division at Snogales, Son. In 1925 Mr. Small was transferred to Mazatlan, Sin., and subsequently he was appointed general manager at Guadalajara, the position he was holding at the time of his appointment as vice-president.

FINANCIAL, LEGAL AND ACCOUNTING

Whitwell W. Coxe, whose appointment as general solicitor of tha Norfolk & Western, with headquarters at Roanoke,

Continued on next left-hand page

ALCO

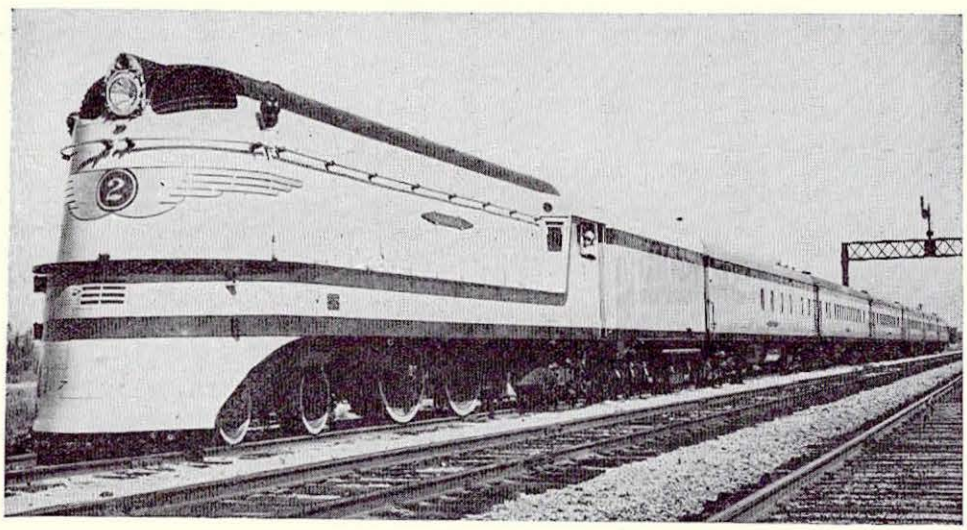
Q.E.D.

IN our advertisement in Railway Age, May 11, 1935, we stated:

"The American Locomotive Company sincerely feels that this engine embodies more thought and ingenuity and refinement of design than any other locomotive that has ever been built. With full knowledge that the eyes of the railway world are on this locomotive, we wish to further express our confident opinion that steam has again marked the beginning of a new era in railway passenger traffic."

Eighteen days after this advertisement appeared, May 29, 1935, the Hiawatha was placed in operation. The two hundred thousandth passenger to travel on the Hiawatha boarded the train at Chicago on March 31, 1936. In other words, in its 10 months of operation the Hiawatha has averaged 20,000 passengers per month. Based on this 10 months of operation, it is earning, above operating expenses, including interest and depreciation, at the rate of almost $700,000 per year.

AMERICAN LOCOMOTIVE COMPANY



30 CHURCH STREET · NEW YORK · N.Y.

Va., was noted in the *Railway Age* of June 20, was born on April 24, 1884, at Roanoke. He was educated at the Univer-

Whitwell W. Coxe

sity of Virginia and became a member of the law firm of Woods, Chitwood, Coxe and Rogers of Roanoke. Mr. Coxe was a member of the first judicial council of Virginia, a member of the Board of Law Examiners of the state, and was president of the Virginia State Bar Association during 1929. He entered railroad service on August 1, 1930, as assistant general solicitor for the Norfolk & Western, the position he held until his appointment as general solicitor, effective July 1.

OPERATING

R. B. Ball, assistant chief engineer of the Atchison, Topeka & Santa Fe System, with headquarters at Chicago, Ill., has been appointed assistant general manager of the Gulf, Colorado & Santa Fe, with headquarters at Galveston Tex., succeeding **W. E. Maxson.**

E. H. Piper, assistant to the general manager of the Chicago, Burlington & Quincy, Lines East of the Missouri river, with headquarters at Chicago, has been appointed to the same position on the Lines West of the Missouri river, with headquarters at Omaha, Neb. He succeeds **L. B. Lyman,** who has been appointed executive assistant at Denver, Colo., as noted in the *Railway Age* of June 27.

J. J. Mahoney, assistant to general superintendent of transportation of the Atchison, Topeka & Santa Fe System, has been appointed general superintendent of transportation, with headquarters as before at Chicago, Ill., succeeding **H. R. Lake. C. W. Philhour,** general yardmaster, with headquarters at Hutchison, Kan., has been appointed assistant to general superintendent of transportation at Chicago, succeeding Mr. Mahoney.

Chris McDonough, superintendent of the Cascade division of the Great Northern, with headquarters at Spokane, Wash., has been promoted to general manager of the eastern lines, with headquarters at Duluth, Minn., to succeed **F. J. Gavin,** who has been appointed assistant to the president as noted elsewhere in these columns. **J. E. Brawley,** trainmaster on the Kalispell division, with headquarters at Whitefish, Mont., has been promoted to superintendent of the Willmar division, with headquarters at Willmar, Minn., to succeed **J. L. Close,** who has been transferred to the Cascade division at Spokane, to replace Mr. McDonough.

L. A. Podesta, assistant regional director in the Eastern district for the federal co-ordinator of transportation, has returned to the New York Central Lines as superintendent of the Chicago Junction, with headquarters at Chicago, succeeding **J. J. Kinsella,** acting superintendent, who has returned to his former position as assistant superintendent, with the same headquarters. At the time of his appointment to the staff of the co-ordinator in 1935, Mr. Podesta was serving as superintendent of the Indiana Harbor Belt, with headquarters at Gibson, Ind. **C. E. Hinchman,** who was formerly assistant superintendent of the Indiana Harbor Belt and who has been acting superintendent during the absence of Mr. Podesta, has been appointed superintendent of the I.H.B., with headquarters at Gibson. **L. A. Payne,** a trainmaster on the New York Central, has been appointed assistant superintendent of the I.H.B. at Gibson, to succeed Mr. Hinchman.

Effective July 1, the Chicago, Rock Island & Pacific System, which heretofore has comprised two operating districts, was divided into three such districts, known as the First, Second and Third districts. The First district includes the Chicago Terminal division, the Illinois division, the Iowa-Minnesota division and the Cedar Rapids-Dakota division; the Second district comprises the Nebraska-Colorado division, the Kansas City-St. Louis division, and the El Paso-Amarillo division; and the Third district consists of the Oklahoma division, the Arkansas-Louisiana division and the Southern division. **W. H. Dick,** superintendent of the Colorado-Nebraska division, with headquarters at Fairbury, Neb., has been appointed general superintendent of the First district, with headquarters at Des Moines, Iowa. **J. J. Breheny,** general superintendent at Des Moines, has been appointed general superintendent of the Second district, with headquarters at Kansas City, Mo. **C. B. Pratt,** general superintendent, with headquarters at El Reno, Okla., remains at that point as general superintendent of the third district.

Francis R. Mullen, who has been appointed general manager of the Chicago, Burlington & Quincy, lines west of the Missouri River, with headquarters at Omaha, Neb., as reported in the *Railway Age* of June 27, has been in the service of the Burlington for 43 years. He was born on October 6, 1876, at Pulaski, N. Y., and studied two years at the University of Nebraska. He entered the service of the Burlington on April 18, 1893, as a night telegraph operator, serving in this position at Havelock, Neb., and Lincoln, until 1895, when he was appointed dispatcher at the latter point. Nine years later Mr. Mullen was advanced to chief train dispatcher with the same headquarters, and in 1907 he was further promoted to trainmaster at Lincoln, being transferred to McCook, Neb., in May, 1911. In November of the same year, Mr. Mullen was promoted to superintendent at Ster-

Francis R. Mullen

ling, Colo., and in September, 1912, he was transferred to Omaha, Neb., and thence to Wymore, Neb., in November, 1916. In June, 1919, he was transferred to Lincoln, Neb., where subsequently he was given the title of general superintendent, the position he was holding at the time of his recent appointment as general manager at Omaha.

ENGINEERING AND SIGNALING

Effective June 16, the departments heretofore reporting to **W. L. Seddon,** chief consulting engineer of the Seaboard Air Line, who has retired, as reported in the *Railway Age* of June 27, will be transferred to the jurisdiction of **W. D. Faucette,** chief engineer.

Coincident with the division of the Chicago, Rock Island & Pacific Lines into three operating districts on July 1, a district maintenance engineer was appointed for each district. **L. J. Hughes,** division engineer of the Colorado-Nebraska division, with headquarters at Fairbury, Neb., was appointed district maintenance engineer of the First district, with headquarters at Des Moines, Iowa. **W. E. Heimerdinger,** division engineer of the Cedar Rapids-Dakota division, with headquarters at Cedar Rapids, Iowa, has been appointed district maintenance engineer of the Second district, with headquarters at Kansas City, Mo. **H. T. Livingston,** trainmaster on the Arkansas-Louisiana divisions, at Little Rock, Ark., has been appointed district maintenance engineer of the Third district, with headquarters at El Reno, Okla.

OBITUARY

Harry Duncan Earl, general manager of the Texas & Pacific, with headquarters at Dallas, Tex., died at a hospital in that city on June 30. He was 57 years old.

W. J. Ormsby, master mechanic on the Illinois Central at Freeport, Ill., died suddenly on June 26 of a heart attack, while attending a conference of officers of the railway at Chicago.

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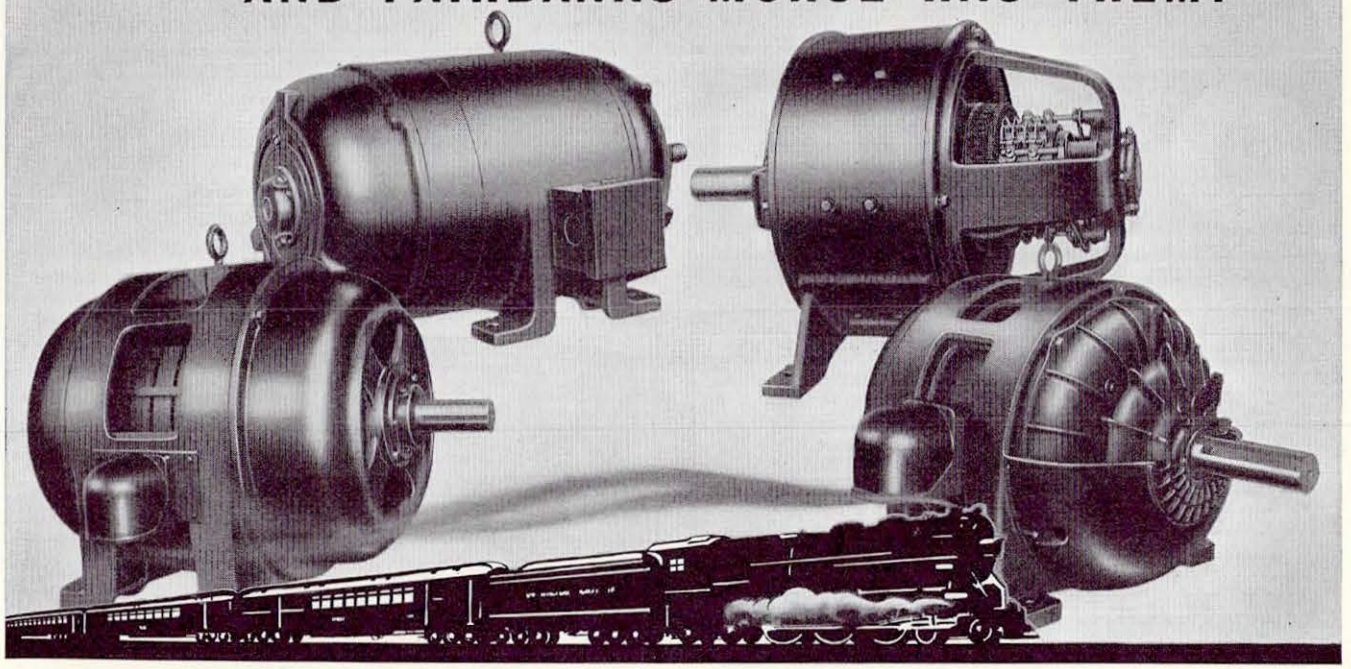

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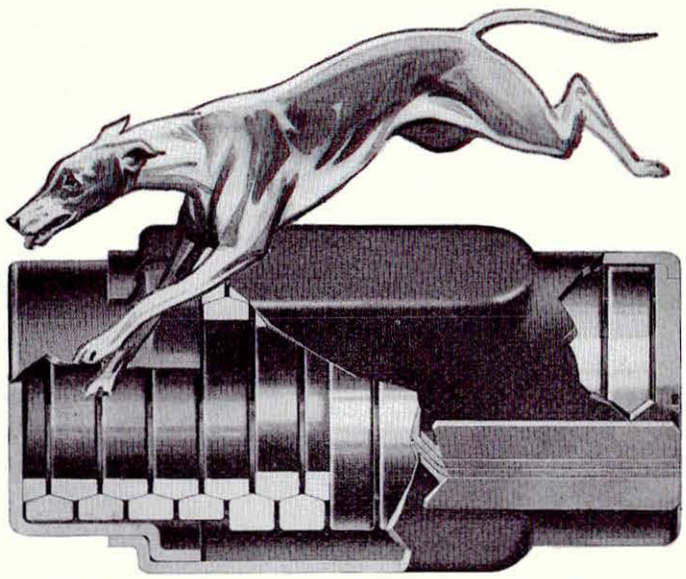

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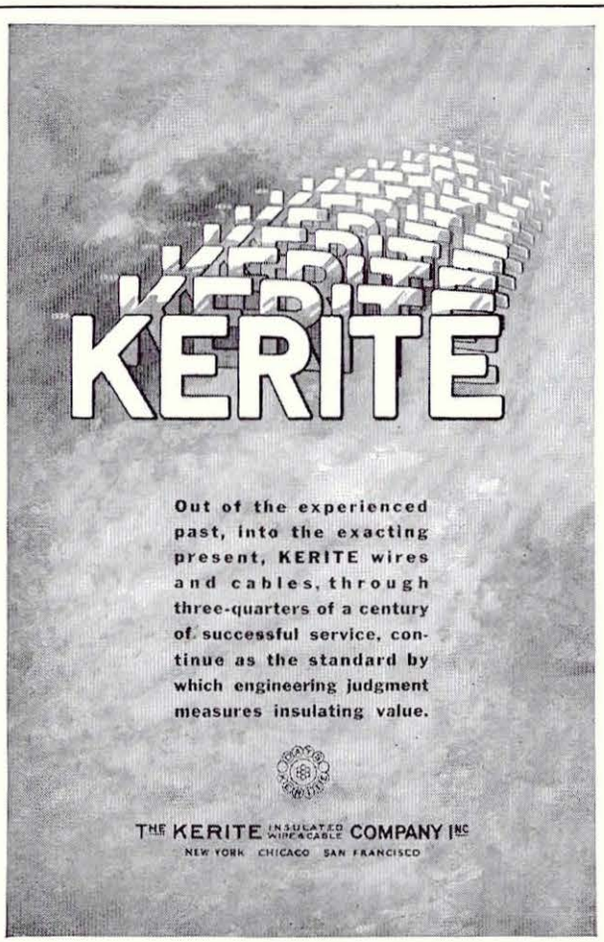
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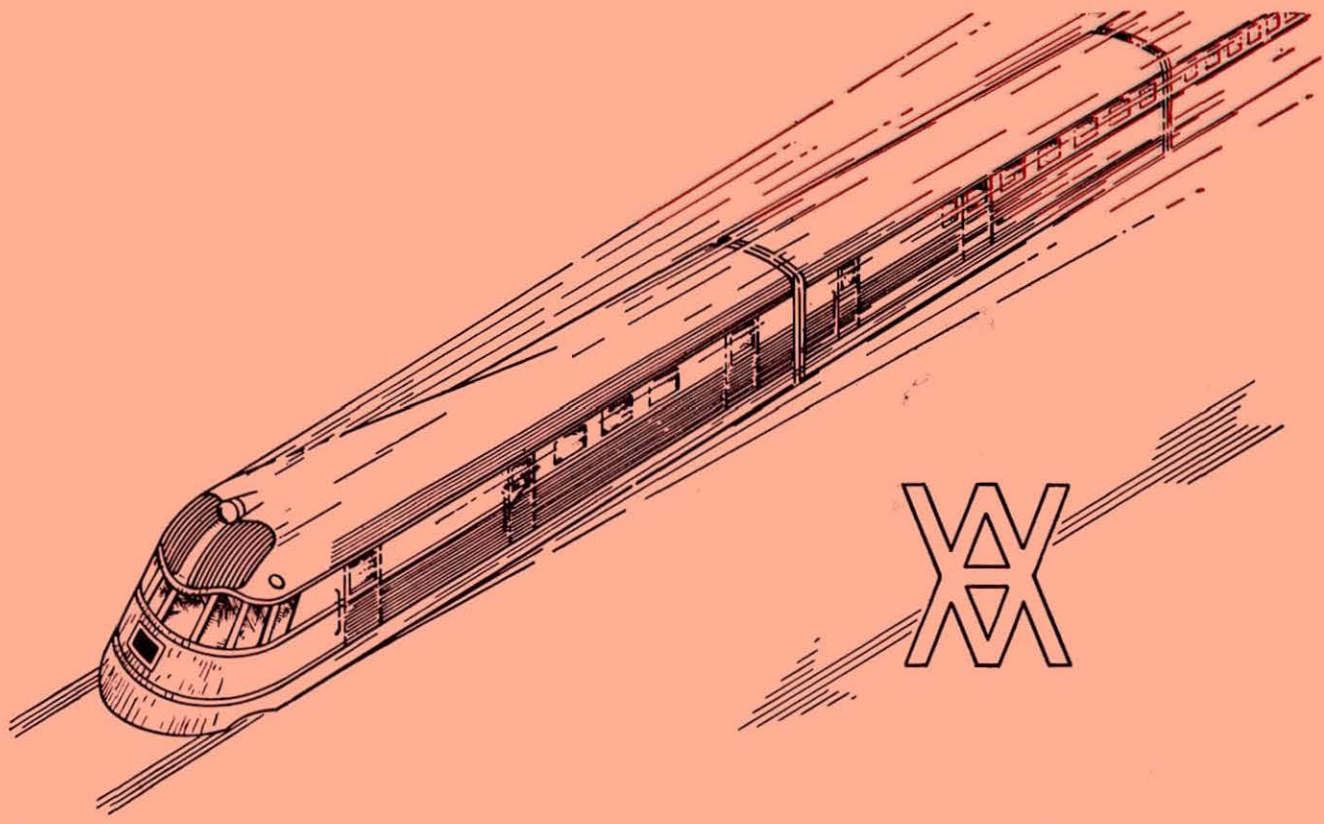

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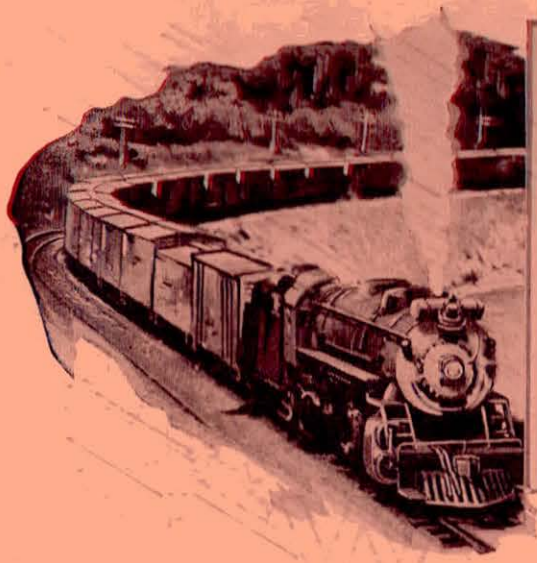

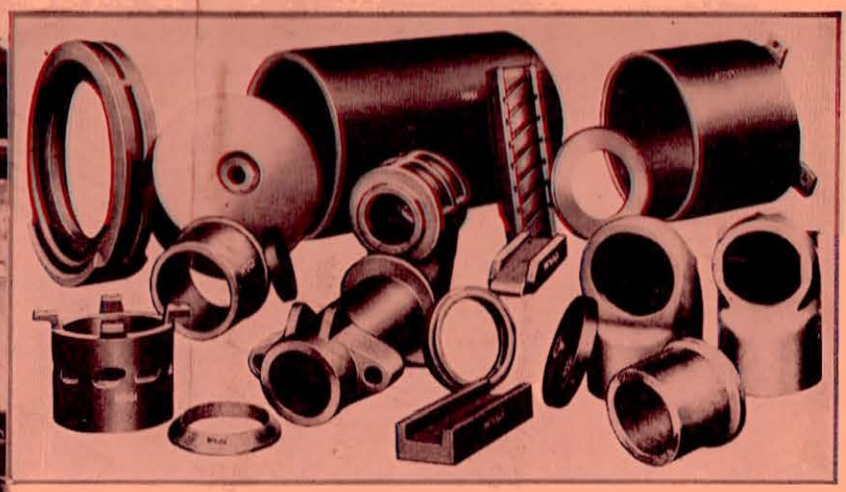

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